



Book of Proceedings

ICMEM

THE 7TH INTERNATIONAL CONFERENCE
ON MANAGEMENT IN EMERGING
MARKETS (ICMEM) 2022

Diving into MetaVerse: The Future of Business
& Management in Emerging Markets

SBM ITB
School of Business & Management

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PENDIDIKAN TINGGI TEKNIK DI INDONESIA

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THE 7TH INTERNATIONAL CONFERENCE
ON MANAGEMENT IN EMERGING
MARKETS (ICMEM) 2022

Diving into MetaVerse: The Future of Business
& Management in Emerging Markets



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Preface



Dear Colleagues,

On behalf of the Conference Organizing Committee, we cordially invite you to the 2022 the 7th International Conference on Management in Emerging Markets on August 10-12, 2022, i.e. ICMEM 2022. ICMEM 2022 is a continuation of six previous annual conferences organized successfully by the School of Business and Management, Institut Teknologi Bandung, since 2016.

Building on the success of previous meetings, the theme for 2022 is "**Diving into MetaVerse: The Future of Business & Management in Emerging Markets**". Metaverse is a new virtual world based on 3-dimensional digital. In the metaverse, people can carry out various activities such as playing, doing business, shopping, and other activities without going out of the house. The phenomenon of the virtual metaverse world is not only attractive to investors but also to business people. Along with the development of the metaverse, of course, many business people see the presence of the metaverse as a new business opportunity. As ICMEM 2022 will provide a co-creation platform where all stakeholders from, government, and society interact through business academic research presentations, panel discussions, workshops, and keynote talks from leading global business and management think tanks.

ICMEM 2022 will host discussions on research work on highly relevant business and management topics ranging from industry 4.0, the latest industry metaverse, blockchain games, and data analytics to sustainability issues. In addition, two companion events will also be held in conjunction with ICMEM 2022, namely the Swiss Innovation Challenge Indonesia (SICA) and the International Graduate Colloquium (IGC). IGC is a forum for students postgraduates to present and discuss their developing research work, such as cutting-edge research and development of conceptual models, empirical findings, etc.

In closing, we hope to warmly welcome you to ICMEM 2022 and that you have an enjoyable, memorable and productive time at ICMEM this year.

Warm regards.

Kurnia Fajar Afgani, MBA
Organizing Committee Chair

Preface



We thank God Almighty for all the blessings and graces given to us, so it is with pleasure, on behalf of the School of Business and Management, we present the **Conference Proceedings of the 7th International Conference on Management in Emerging Markets (ICMEM) 2022**.

This Proceedings Conference book contains several papers discussing the issue of the Metaverse and digital business in Emerging Markets. Highlight practice of the idea of digitalization in business and management for both industries and academic applications.

Not only discussing metaverse issues, but ICMEM 2022 also accepts manuscripts in various business and management disciplines, from business and financial risk, strategy and marketing to operations management, and decision making to entrepreneurship and other related fields. Papers were submitted

in the Research Format and Case Format from scholars, graduate, and undergraduate students. The conference facilitates researchers, innovators, technologists, governments, students, and practitioners to exchange and share experiences and new ideas and the results of their research on all aspects of the business ecosystem and innovation in business. Besides that, they discussed challenges faced and solutions that can be applied to overcome challenges in managing uncertainty in the digital era, especially in developing countries.

ICMEM 2022 conference theme raised the issue of "Diving into Metaverse: The Future of Business & Management in Emerging Markets." The metaverse can be defined in many ways, however, one way to define it is to use the concept of time. There is no doubt that our lives are becoming more and more digitalized and virtualized. Today, the world has entered the era of the digital economy along with the challenges that come with it. Just like in developed countries, developing countries also experience challenges to be able to adapt to this new era.

The 7th International Conference on Management in Emerging Markets (ICMEM) 2022 discusses how businesses can respond to the latest challenges of society's digital economy. This is in line with the challenges of uncertainty faced by developing countries. Therefore, there is an urgent need for academics and researchers to participate and collaborate to provide solutions and ideas for businesspeople, governments, and investors on managing uncertainty in the digital era, especially in developing countries. Everyone can cope with it in any capacity, which directly addresses the issue of the ICMEM 2022 theme.

This opportunity allows us to express our gratitude to Prof. Reini D. Wirahadikusumah, Ph.D., the Rector of ITB, for her support. Furthermore, I would also like to thank the chairperson, organizing committee, university partners, scientific committee, authors, general participants, and other parties involved in organizing the conference, including the finalization of the Conference Proceedings. We hope that the proceedings of this conference will be helpful.

Prof. Dr. Ir. Jaka Sembiring, M.Eng,

Acting Dean, School of Business and Management Institut Teknologi Bandung

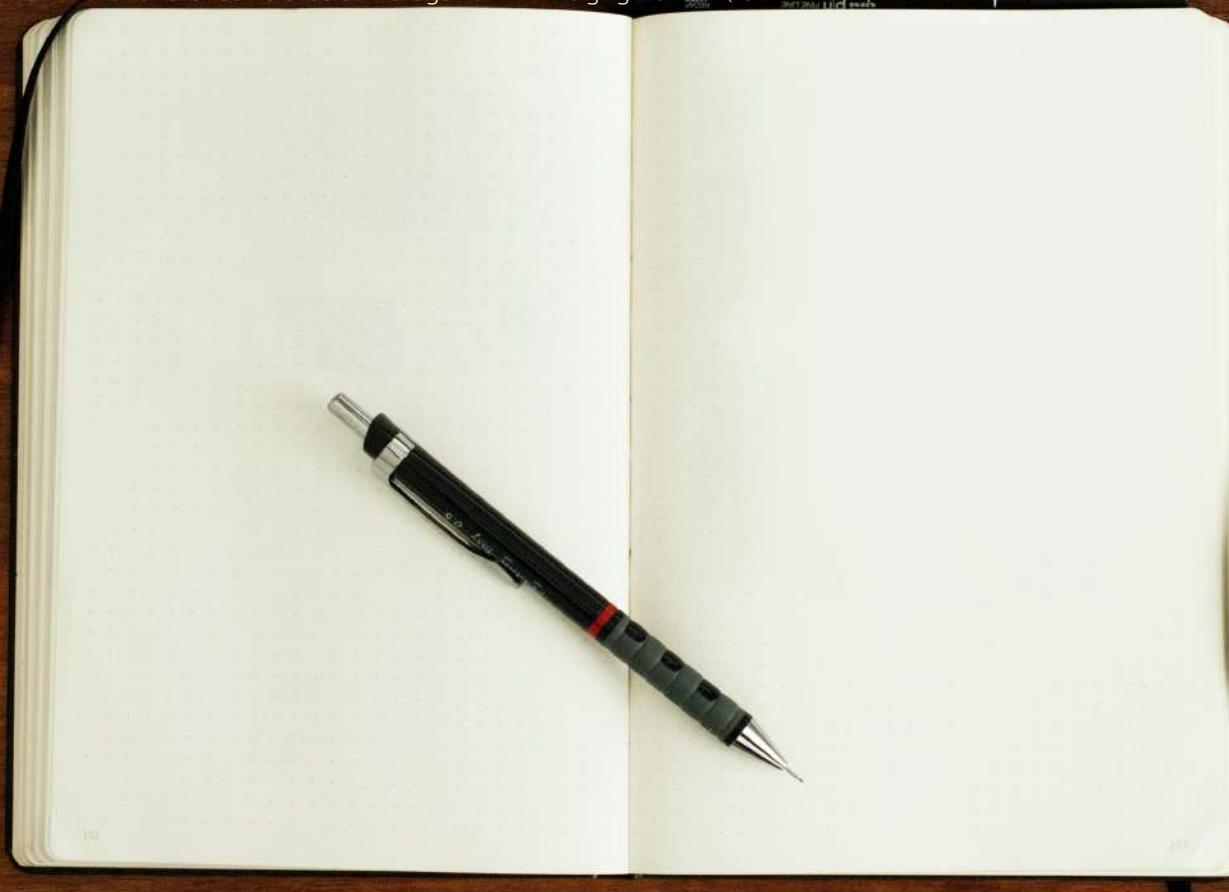


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Paper 1

Proposed Digital Marketing Strategy for Coworking Space
(Case Study at Nextspace Bandung)

Ray Burton and Laura Lahindah

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Abstract - Along with the growing number of freelancers and start-ups in Indonesia, this has brought a new style of work order, where the work situation has the characteristics of being more free, flexible and independent. As a reaction to the new work order, new forms of work have emerged in various countries around the world, including Indonesia, such as the coworking space that is currently popular. Nextspace is a coworking space in Bandung that was established in 2019 with its address at Jl. Trunojoyo no. 11. The problems faced by Nextspace are unstable sales growth, lack of consumer awareness about the coworking space concept, and the low involvement of their digital promotional media (Instagram). The main problem for Nextspace businesses is that they need to have the right digital promotional media as one of the main promotions they do in this digital era. In proposing the right strategy for Nextspace, there are two analyzes carried out. External analysis consists of PEST analysis, Porter's Five Forces analysis, competitor analysis, and consumer analysis. Internal analysis consists of STP analysis and marketing mix analysis (7P). After conducting an external and internal analysis, then a root cause analysis was carried out to identify the problems faced by Nextspace. To overcome these problems, a SWOT analysis was developed which was then developed into a TOWS matrix which would later be formulated into several appropriate digital marketing strategies, so as to increase the involvement of Instagram NextSPACE as one of the main promotional media. The results of several digital marketing strategy actions that Nextspace can prioritize by adjusting existing resources, consist of conducting comprehensive social media campaigns, creating seasonal promotions through Instagram, creating interactive content by leveraging existing features, and using SEO to improve website search rankings.

Keywords - Nextspace, coworking space, Bandung, digital marketing, Instagram

I. INTRODUCTION

A. Background of the Problem

With the growth of technology, the current era is characterized by dematerialization. The current generation is no longer in touch with their workplace, but with their co-workers and their own tasks.

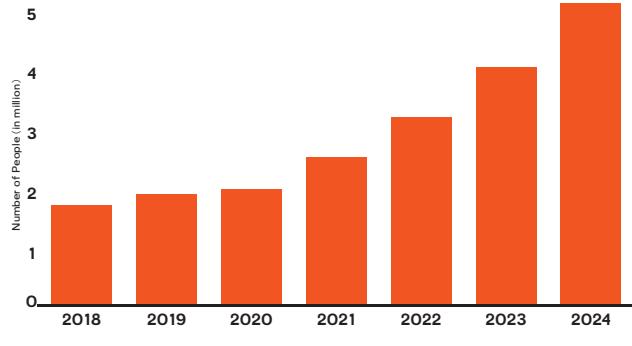


Fig. 1. Number of people working in coworking spaces around the world

Coworking spaces are shared workplaces used by a wide range of professionals, mostly freelancers working at various levels of specialization in a broad domain of knowledge industries. Coworking started as a way to combine the independence of freelance work and a community sense of office space. The coworking philosophy is that having people working in different fields makes everyone's work more valuable and unique, providing confidence and more quality in the work itself. Like other platforms in the sharing economy, coworking is changing the way we travel, the way we shop, and the way we communicate.

Bandung is one of the most creative cities in Indonesia as some of its markets are created through fashion, music and design. Ridwan Kamil as the Governor of West Java said that "as many as 60% of the business or economy in the city of Bandung is filled by young entrepreneurs, especially in small and medium enterprises (SMEs)" and he said that "with the development of entrepreneurs in Bandung, the government continues to provide space for Entrepreneur". Today, coworking has become a new way of working and due to its flexibility and cost efficiency, this has driven the popularity of coworking spaces in various parts of the world, including the city of Bandung.

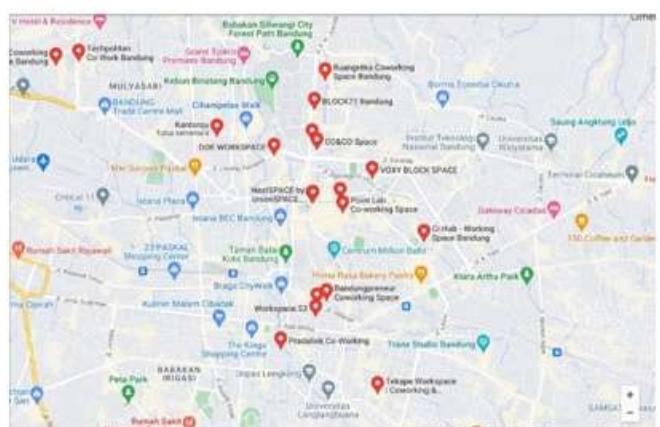


Fig. 2. Coworking space around the bandung area

B. Formulation of the Problem

Coworking spaces offer products that cater to the multiple needs of prospective coworkers in terms of attitudes, values, and situational conditions. The concept of coworking comes from the west, and most Indonesians don't know what coworking is. As a startup, Nextspace is still building brand awareness. The main problem that Nextspace faces is that the coworking trend in Indonesia is on the rise, but this doesn't seem to be in line with market awareness.

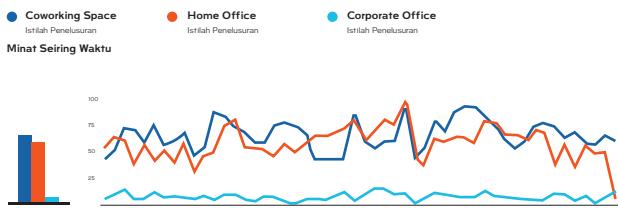


Fig. 3. Interest over time in coworking space

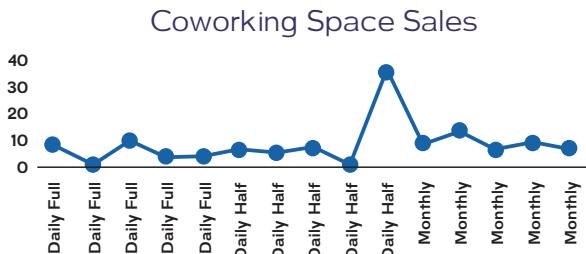


Fig. 4. Coworking space sales plot by time (sep 2021-jan 2022)

Nextspace has offered 10 products, 8 products (Coworking Daily Full, Coworking Daily Half, Coworking Monthly, Private Office, USPB, Meeting Room, Event Space and Classroom) handled by the Pods team and 2 products (Virtual Office and Legal Service) handled by the Cloud team.

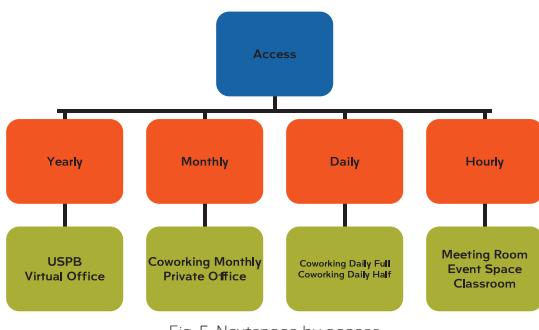


Fig. 5. Nextspace by access

Nextspace tries to increase their brand awareness through their channels, social media, and programs. Nextspace only uses online marketing and personal selling to generate income.

Based on Nextspace's business problems, here is a list of research questions related to the company's business problems:

1. What are the conditions in the industry where

Nextspace works?

2. What is the most appropriate digital marketing strategy for Nextspace?
3. What steps are required to execute a digital marketing strategy for Nextspace?

C. Research Purposes

The main objectives of this research are:

1. Knowing the internal and external conditions of Nextspace.
2. Propose the right digital marketing strategy to reach the market.
3. Identify the steps to do digital marketing for Nextspace.

D. Benefits of Research

The writing of this research is expected to provide theoretical and practical benefits. Theoretical benefits: can add knowledge in the field of Digital Marketing, especially regarding digital marketing strategies. Practical benefits: can provide input for corporate marketers, especially coworking spaces, to formulate the right digital marketing strategy.

II. LITERATURE REVIEW

A. Digital Marketing

Digital marketing is the marketing of products through digital media connected to the internet. Digital marketing refers to the use of digital channels such as the internet to promote, support and market a company's products or services. Digital marketing involves using social media channels in the commercialization process (such as email marketing, online advertising, search engine optimization, social media, pay-per-click, and viral marketing).

B. Digital Marketing Strategy

Digital marketing strategy refers to the strategies that companies use to advertise their products and services and improve their client experience through digital channels. There are various digital marketing strategies, including: social media channels such as Facebook and Twitter, Search Engine Optimization (SEO) email marketing, blogs and websites and marketing of products and services through online personalities and social influencers; companies can also use other digital marketing strategies such as video advertising, sponsoring content on more popular websites and making online sales such as flash sales. When using a digital marketing strategy, companies

can also save on marketing costs because digital marketing is much cheaper than traditional marketing channels, such as billboards, TV ads, and newspaper ads.

C. Coworking Space

Coworking space is a new workspace where users work with other people from different companies/organizations in one place. Coworking space has emerged as an alternative to space in relatively expensive office buildings. Coworking spaces have the advantages needed in doing business that are currently very important, namely networking and collaboration. Coworking space providers usually already provide important facilities for businesses other than a place to work such as internet connections, meeting rooms to meet clients and also team discussions, as well as drinks such as mineral water, tea, and coffee. Coworking space is offered as a solution for anyone who wants to work with greater benefits and lower costs.

D. Previous Research

This previous research is the author's reference in conducting research, so that the author can enrich the theory used in reviewing the research conducted. Previous research that is used as a reference is related to the proposed digital marketing strategy. Based on the results of the research conducted, most stated that the proposed digital marketing strategy must be in line with the company's external and internal analysis and can increase brand awareness.

E. Framework

As a newcomer to the coworking space industry, Nextspace has many problems and challenges. Starting with defining the business problem to find out what kind of problems Nextspace is facing, then doing internal and external analysis to find out the state of the business, then doing a SWOT analysis to find solutions on how to solve Nextspace problems. Internal analysis consists of STP analysis and marketing mix analysis. External analysis consists of PEST analysis, Porter 5 Forces analysis, competitor analysis, and consumer analysis.

F. Research Model

A research model is needed to guide this research and is shown in the figure below:

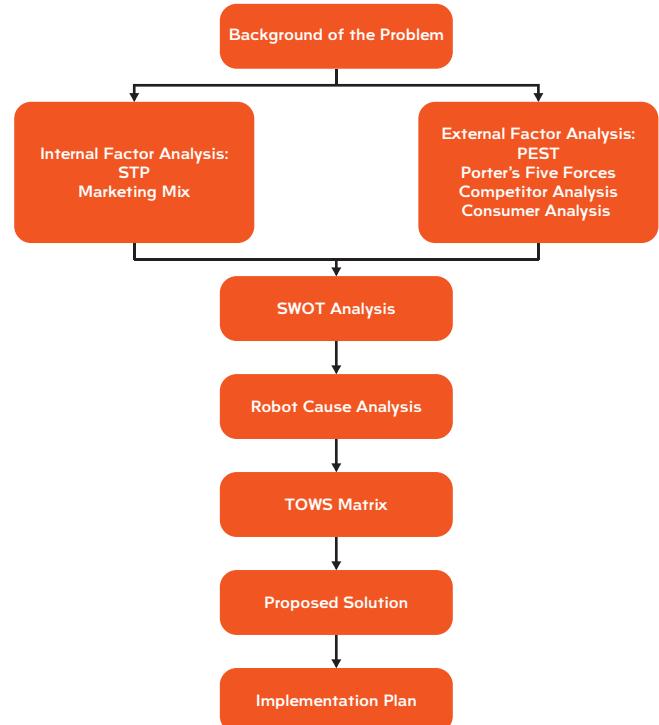


Fig. 6. Research model

III. RESEARCH METHODOLOGY

A. Research Object, Place and Time

The object of this research is the marketing section of Nextspace. This research was conducted in Bandung with the research time starting from March to May 2022.

B. Types of Research

The research method used in this study is a qualitative method.

C. Data Types and Sources

The types of data used in this research are primary data and secondary data. Primary data is obtained from Nextspace managers as well as Nextspace's target market or potential market. Secondary data obtained from agencies or companies or parties related to this research.

D. Data Collection Technique

Primary data was obtained through observation and interviews with Mrs. Indri as Nextspace manager, as well as through distributing questionnaires to Nextspace's target market or potential market. Secondary data obtained through searching on the internet.

E. Data Analysis Method

To solve the problems faced by Nextspace, the authors use TOWS analysis to identify Nextspace alternative digital marketing strategies based on what they have.

IV. DATA PROCESSING AND ANALYSIS

A. Company Profile

Nextspace was founded to provide a space for the creative community to work, connect and collaborate. In 2019 Nextspace has its first place right in the heart of Bandung City.



Fig. 7. Nextspace Logo

B. Organizational Structure and Design Approach

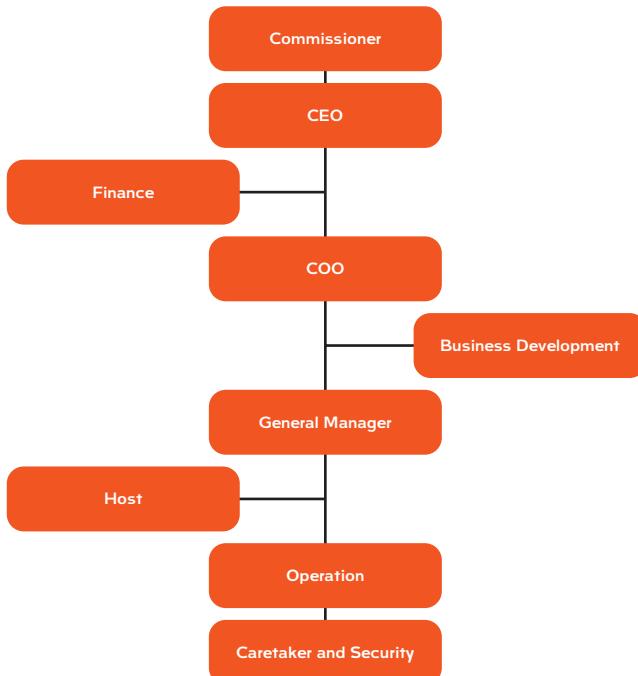


Fig. 8. Nextspace organizational structure

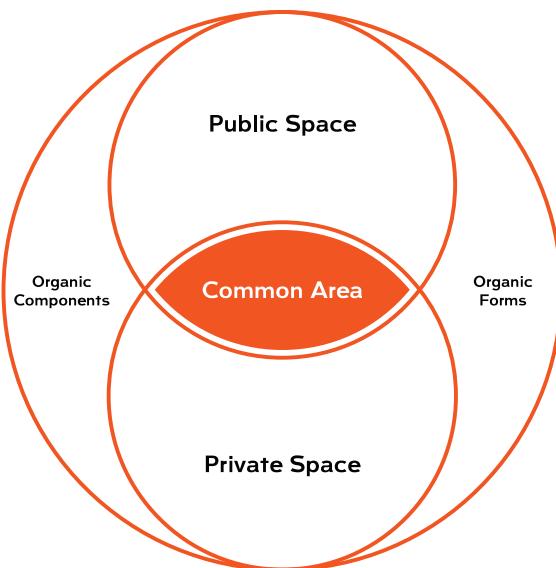


Fig. 9. Nextspace design approach

C. Facilities and Services

1. Public Space: Hotdesk, Event room
2. Private Space: Dedicated desk, Private office space
3. Common areas: Meeting rooms, Idea rooms, Self-service kitchens, Outdoor gardens, Outdoor balconies
4. Services: High speed internet access, Printing and copying, Virtual office services, Business formation, Private lockers, Consulting and mentoring, Program and event management

D. Rental Packages

1. Coworking Daily Full
2. Coworking Daily Half
3. Coworking Monthly
4. Private Office
5. USPB
6. Meeting Room
7. Event Space
8. Classroom
9. Virtual Office
10. Legal Service

E. Location

Nextspace is located in the heart of downtown Bandung, in the Riau area.



Fig. 10. Nextspace (Front View)

F. Internal Analysis: STP

Table 1. - Nextspace Segmenting

Segmentation	Description
Geographic	Region: Bandung Density: Urban
Demographic	Age: >19 years old Gender: Male, Female
Social Class	Occupation: Web developer, IT, Design, Business development, Finance, General, Fintech Education: High school, Bachelor, Master Income: IDR 2,000,000 – IDR 50,000,000
Psychographic	Lifestyle: Hard worker, Digital lifestyle Personality: Sociable, Active, Humble, Open, Closed, Creative, Initiative, Explorer
Behavior	People who want to: start a business, need a place to work, build a community, need relationships

Table 2 - Nextspace Targeting

Targeting	Description
Geographic	Region: Bandung Density: Urban
Demographic	Age: 18 - 40 years old Gender: Male, Female
Social Class	Occupation: Entrepreneur, Employee, Student, Business Development Education: Bachelor, Master, Doctor Income: > IDR 1,500,000
Psychographic	Lifestyle: Sociable, Up-to-date Personality: Sociable, Attractive, Influential

Behavior

People who want to do something in the center of Bandung City with a comfortable place to network, need a place to work, and grow their business

Nextspace's positioning is to develop communication and activities through coworking spaces that offer an environment where community, collaboration, and creative thinking are part of work life.

G. Internal Analysis: Marketing Mix

Table 3. - Nextspace Package

No.	Package	Description
1.	Coworking Daily Full	Someone who wants to rent for a day and will get unlimited internet facilities and access for a day
2.	Coworking Daily Half	Someone who wants to rent 12 hours and will get unlimited internet facilities and access for 12 hours
3.	Coworking Monthly	Someone who wants to rent a month and will get unlimited internet facilities and access for a month
4.	Private Office	The office concept provided by Nextspace with facilities and internet provided for a minimum of 1 month rental and will get free access in and out during operating hours
5.	USPB	The office concept provided by Nextspace with facilities and internet provided for a minimum of 12 months rent and will get free access in and out during operating hours
6.	Meeting Room	Room with a private concept that can accommodate 8-15 people at a rate adjusted to rental hours
7.	Event Space	Space offered by Nextspace to hold events with a capacity of 20-200 people, using an hourly rental rate
8.	Classroom	Someone who wants to rent 1 hour and will get unlimited internet facilities and access for 1 hour
9.	Virtual Office	Based on the facilities and benefits offered, this package is divided into 3, namely Lite, Budget, and Premier
10.	Legal Service	The services offered include making PT, CV, and PMA



Fig. 11. Nextspace Coworking Space



Fig. 12. Nextspace Meeting Room



Fig. 13. Nextspace Communal Area

An Instagram post from the account "betterwith.us". The post features a yellow promotional overlay with the text "Pods US Coworking Promo" and "Work Together Daily Pass". Below the overlay is a photograph of the interior of a coworking space with desks and chairs. The Instagram interface shows 129 likes and a caption in Indonesian: "betterwith.us Hello #GenerasiUS kali ini ada promo spesial loh buat kamu dan bestie kamu. Check yuk!"

Fig. 14. Nextspace Coworking Space Promotion

A screenshot of the Instagram profile for "betterwith.us". The profile picture is a red circle with the letters "US". The bio reads: "US Coworking Space Workspaces • Private & Virtual Office • Legal • Event To help people work and live better ✨". It includes contact information: email (hello@betterwith.us), phone (+62 811-1085-505), and a link (linktr.ee/betterwithus). The profile has 116 posts, 502 followers, and 6 following. The feed shows various posts: "Coworking Promo", "Private Office", and "Meeting and Event Space". Each post includes a caption and a small image preview.

Fig. 15. Nextspace Instagram



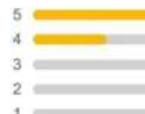
Fig. 16. Nextspace Location



Send to your phone

Send

Review summary



4.8

★★★★★
66 reviews



"I really love the positive atmosphere, nice staff and many things."

★★★★★



"Cozy place, nice place"

★★★★★



"Clean, modern and modest in a coworking standard."

★★★★★

Fig. 16. Nextspace Rating

Table 4. - Nextspace Product Pricelist

No.	Access	Product	Price (IDR)
1.	Daily	Coworking Daily Full	75.000/day
2.	Daily	Coworking Daily Half	50.000/day
3.	Monthly	Coworking Monthly	585.000/month
4.	Monthly	Private Office	1.100.000/pack /month
5.	Annual	USPB	6.000.000/pack /year
6.	Per Hour	Meeting Room	150.000/hour
7.	Per Hour	Event Space	500.000/hour
8.	Per Hour	Classroom	250.000/hour

9.	Annual	Virtual Office	Lite: 4.000.000/year/ company
			Budget: 6.500.000/year/ company
10.	-	Legal Service	Premiere: 9.000.000/year/ company

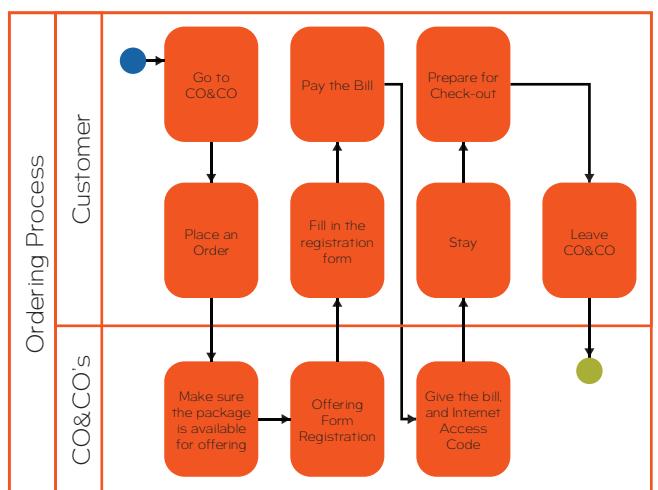


Fig. 18. Ordering process at nextspace

H. External Analysis: PEST

The PEST analysis shows that there are both positive and negative factors to consider in the coworking industry. Coworking is inherently an industry that works primarily with independent freelancers and small businesses. Space operators, like small businesses themselves, face possible low revenue streams and often need to increase their space with other sources of income. Socially, building a community may be much more challenging than designing a functional space. Coworking is a young and growing industry that is well positioned to gain lucrative political support especially for the economic and social benefits it provides to local communities. It is an active vehicle that transports new field workers and integrates seamlessly with new technologies and business trends. While there are many challenges in operating a coworking space, the long-term benefits are enormous with many new and unexpected opportunities yet to unfold.

I. External Analysis: Porter 5 Forces

Based on Porter's five forces analysis framework, the coworking industry has several interesting aspects. This is a very new and growing industry with few competitors and equivalent substitutes. Entering this industry can be

difficult, not from a capital requirements perspective, but because of the essential need to integrate the right mix of suppliers and buyers into a sustainable business model.

J. External Analysis: Competitors

Table 5 - Competitor Analysis

Marketing Mix	Nextspace	Eduplex	CO&CO
Product	Operational hour Monday-Friday: 09.00 – 18.00 Saturday-Sunday: closed	Operational hour Monday-Friday: 08.00 – 21.00 Saturday-Sunday: 08.00 – 19.00	Operational hour Monday-Friday: 08.00 – 20.00 Saturday: 10.00-15.00 Sunday: closed
Price	Starting from IDR 50.000.000	Starting from IDR 60.000.000	Starting from IDR 50.000.000
Place	Central Bandung Near school area, culinary, shopping center	Central Bandung Near school area, culinary, shopping center, famous street	Central Bandung Near school area, culinary, shopping center
Promotion	Sales promotion: daily pass, seasonal discount, student discount Ads: Instagram, Facebook	Sales promotion: student discount, daily pass Ads: Instagram, Facebook, Twitter	Sales promotion: daily pass, seasonal discount, student discount Ads: Instagram, Facebook, Twitter
People	Management team (finance, business development and general manager), host staff, management staff, security staff and operations staff	Management team (sales, marketing, accounting, finance, human resources) service staff, security staff, cleaning staff, kitchen staff and bar staff	Management team (finance, business development and general manager), host staff, management staff, security staff and operations staff
Physical Evidence	Public spaces (hotdesk, event rooms) Private rooms (dedicated benches, private offices) Common areas (meeting rooms, idea rooms, self-service kitchens, outdoor gardens, outdoor balconies)	Main area, meeting room, event room, game room, cafe	Public spaces (hotdesk, event rooms) Private rooms (dedicated benches, private offices) Common areas (meeting rooms, idea rooms, self-service kitchens, outdoor gardens, outdoor balconies)
Process	Onsite reservation	Onsite reservation	Onsite reservation

K. External Analysis: Customers

Overall, several facts have been found from the research conducted by the author. First of all, the most popular and widely used social media is Instagram. Second, almost everyone uses a smartphone to access social media. Third, according to the survey, it is proven that the most attractive promotional content is related to product advantages. Finally, this study also finds that the company's track record is the most important element in increasing customer trust. Departing from the conclusion of the customer analysis above, this study will pay special attention to Instagram as a promotional medium, as well as the addition of Facebook and Tiktok. The study

will formulate strategies that showcase the benefits of products and useful content to increase brand awareness. The strategy will also use paid advertising to optimize social media use.

L. SWOT Analysis

Strength

1. Good rating
2. Strategic location
3. Extensive network
4. Nice atmosphere

Weakness

1. Internal sales growth is still volatile (internal sales growth is unstable).
2. Room, especially meeting rooms are limited in number.
3. The registration and ordering system is still offline.
4. Low follower engagement on social media (Instagram).
5. Digital marketing is still lacking.

Opportunity

1. Purchase of recurring memberships from registered members.
2. Establish cooperation with BEKRAF which supports creative economic growth.
3. Increasing trend of WFH (Work From Home)

Threat

1. The rapid growth of the number of competitors in Bandung.
2. There are substitutions such as cafes that provide a table and internet connection.
3. The designs and services offered are easy to imitate.
4. Most people are still unfamiliar with the concept of coworking space.

M. Root Cause Analysis



Fig. 19. Root cause analysis on nextspace

N. TOWS Analysis

Table 6 - Nextspace Tows Matrix

	Strength (S)	Weakness (W)
	1. Good rating 2. Strategic location 3. Extensive network 4. Nice atmosphere	1. Unstable internal sales growth 2. Limited meeting room 3. Offline ordering system 4. Low engagement on social media 5. Lack of digital marketing
Opportunity (O)	SO Strategy	WO Strategy
1. Repeat membership purchases from registered members 2. Cooperating with BEKRAF 3. Increasing trend of WFH (Work From Home)	S2-O1 Comprehensive media social campaign S3-O2 Hold an event in collaboration with BEKRAF	W1-O3 Further research and development on the coworking industry in Bandung W4-O1 Create interactive content by leveraging existing features W1-O1 Create a membership program W5-O3 Using Instagram ads as promotional media W5-O3 Using search engine optimization to improve website search rankings
Threat (T)	ST Strategy	WT Strategy
1. The rapid growth of competitors in Bandung 2. There is a substitution 3. The designs and services offered are easy to imitate 4. The concept of a coworking space that is not widely known	S4-T4 Make a public relations marketing strategy S1-T1 Making seasonal promotions	W1-T4 Sales promotion using influencers to educate and explain about the benefits of working in a coworking space W3-T3 Improve facilities and systems

O. Proposed Solution

1. Comprehensive social media campaign: Spreading information about the coworking space concept. Leveraging the most engaged content, Scheduled content shooting, Trademark photos, Feed settings
2. Create seasonal promotions via Instagram: Ramadan month, 10.10/11.11/12.12/12.3/23.4, National holiday promo

(independence day)

3. Create interactive content by utilizing existing features: Using Instagram Ads as promotional media, Calls to be active on Instagram with Trivia or Fun Fact, Giveaway
4. Using SEO to improve website search rankings

V. CONCLUSION AND SUGGESTION

A. Conclusion

1. In terms of internal conditions, Nextspace has great potential which is supported by a strategic location. For external conditions, although there are many challenges in operating a coworking space, the long-term benefits are quite large with many new opportunities yet to be revealed.
2. There are four strategies for a total of eleven actions to execute a digital marketing strategy for Nextspace. The first strategy is a comprehensive social media campaign, the second is to create interactive content by utilizing existing features, the third is to create seasonal promotions through Instagram, and the fourth is to use search engine optimization to improve website search rankings.
3. A comprehensive social media campaign consists of five actions, namely disseminating information about the coworking space concept, leveraging the content that gets the most engagement, scheduled content shooting, trademark photos, and setting feeds. Creating interactive content by utilizing existing features consists of three actions, namely using Instagram ads as promotional media, active invitations on Instagram, and giveaways. Seasonal promotions through Instagram consist of three actions, namely Ramadan promotions, beautiful date promotions and big day & national day promotions. Using SEO consists of one act which is to use Google Reviews.

B. Suggestion

This research only focuses on digital marketing strategies. Nextspace is a startup company with great potential for development, so other authors may be able to discuss strategies for other business areas such as human resources, finance, and operations that are not included in this study.

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Paper 2

Analyzing Barrier Factors That Influence The Patient's Intention To Use The Online Platform In Taking Queue Number

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - The ease of queuing is the most important factor affecting patient satisfaction, so we suggest adopting a queuing system. The fact and the problem is, several factors affect the performance of the system, such as patient preferences so that the system is not used. The purpose of this study was to find out what inhibiting factors influence the patient's intention to use an online platform to get a queue at the Pekanbaru Beauty Clinic based on the Innovation Resistance Theory (IRT) framework. This survey was conducted qualitatively using in-depth interviews of 10 respondents. Respondents in this study domiciled in Pekanbaru aged between 18 to 64 years and have had treatment at a Pekanbaru beauty clinic. This study shows that the existing barriers include 5, namely, Usage Barrier, Value Barrier, Risk Barrier, Tradition Barrier, and Image Barrier. This validates that the obstacles that occur according to the existing study are the same as those in Pekanbaru. The findings will provide strategies for queuing platform entrepreneurs how to increase the number of people using online platforms to take queue numbers.

Keywords - Online Queues; Barrier; Usage Intention; IRT; Healthcare Institutions

I. INTRODUCTION

Customer satisfaction is a very important issue in the service sector. In addition, the healthcare industry implements many innovations, strategies and initiatives to improve customer satisfaction. One of them is to improve the performance of health stakeholders to achieve these final results [1]. They often face many exciting opportunities and challenges in serving patients, including: In today's world, it is clear that technology is moving in a more sophisticated direction. For example, many systems have been digitized, most of them leading to the development of web-based systems. With this possibility, it will be more convenient if it is applied to a public service system such as an online queuing system [2].

Queue is an event that goes through the process of arrival, queuing, and waiting for the last service, and can be recognized by both people and objects. The online queuing system is a remote health service that has developed along with the rise of COVID-19, reducing viral infections and physical contact at health care facilities and avoiding congestion [3]. Proper and effective

queuing/appointment management of medical facilities is what patients want. Waiting leads to poor outcomes and patient dissatisfaction [4]. The data follows that the most important factor influencing patient satisfaction is the ease of queuing/appointment acquisition (55.5%). Therefore, the queue system for health facilities is web-based [5].

Factors Affecting the Patient Satisfaction

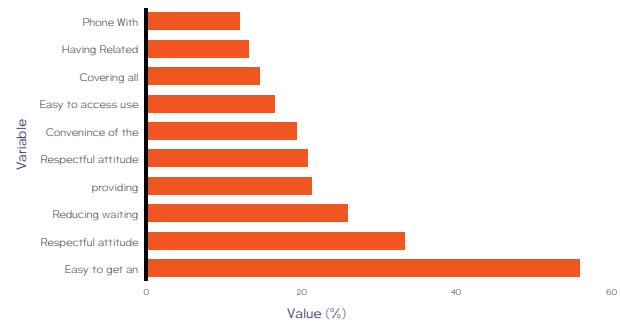


Figure 1 The Most Important Factors Affecting the Patient Satisfaction of Outpatient Clinics [5].

After the implementation of the web-based queuing system, many effects showed positive changes [6]. And the most influential was (21/10) "downsizing", followed by "increased happiness" (7/2)



Figure 2 Impact After Implementing the 21 Web-Based Scheduling Systems [6].

Although there is a lot of evidence of the positive impact of the web-based queuing system, there are still factors that affect the performance of the system including patient preferences. The majority of patients (67.1%) agreed with the implementation of a web-based appointment scheduling system [5]. There are several previous studies that have discussed the online queue barriers. The positive impact of this queuing system is not realized by patients who come from low and middle income countries [4]. Because many patients report negative experiences in

terms of communication, short visits or long waiting times. Patients prefer to come directly to the facility and queue because this system can be confusing or perceived as too complex. It is socioeconomic disparities that reduce patient confidence in innovation in health facilities, rather than the failure of queuing system technology solutions [4].

Med-Ease is an integrated online platform that provides online queuing services. Currently, Med-Ease has a customer, namely Felicia Glowing Clinic in Pekanbaru. However, the problem is that for 2 months starting from December 9, 2021 to February 9, 2022, only 10 of the 757 arrivals (not the number of patients) used Med-Ease. In the 757 arrivals, there are the same patients, who have become loyal customers of Felicia Glowing Clinic who came in January and February. Facts show that patients are low in intention to take online queues using Med-Ease at Felicia Glowing Clinic. Therefore, the researcher assumes that there are barriers that affect the patient's intention to take online queues using Med-Ease at Felicia Glowing Clinic.

Felicia Glowing Clinic Visit: 9 December
2021 - 9 February 2022

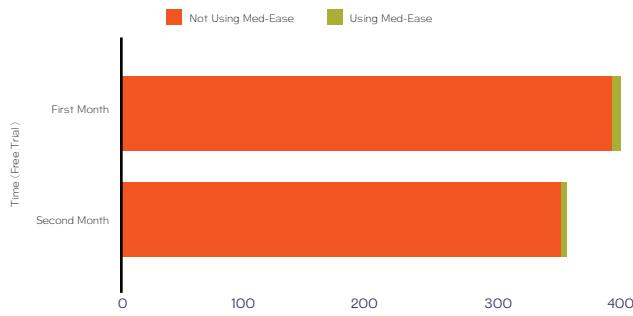


Figure 3. Felicia Glowing Clinic Visit

Based on the research background and problem formulation above, the research questions is :

- What are the barrier factors that influence the patient's intention to use the online platforms in taking queue numbers?

Based on the research question above, the research objective is :

- To find out what are the barrier factors that affect the patient's intention to use the online platform in taking queue numbers.

II. LITERATURE REVIEW

Online queuing is a remote medical service that is evolving along with the spread of COVID 19 to reduce viral infections, reduce physical contact in health facilities, and avoid congestion [7]. Proper and effective queuing/appointment management of medical facilities is what patients want. Waiting leads to poor patient outcomes

and patient dissatisfaction [4]. The data shows that the most important factor influencing patient satisfaction is the ease of queuing/ordering (55.5%) Therefore, the queue system for health facilities is web-based [5].

Ram (1987) introduced the concept of Innovation Resistance Theory (IRT) which was developed by Ram and Sheth. Here, innovation resilience can be defined as behavior that results from rational thinking and decision making regarding the adoption and use of innovations due to changes that may result from changes to the existing status quo or deviations from existing belief systems. First published in 1987, Innovation Resistance Theory is the first attempt to explain innovation resistance in terms of innovation and user characteristics, and is a good suggestion for understanding user aversion to innovation. Recently, there has been a significant increase in resistance research interest, especially in the context of information systems [8]. To study user resistance to innovation through the completeness of IRT becomes a very useful framework. good for). In addition, existing theoretical frameworks (such as innovation dissemination and technology acceptance models) do not focus on testing user resistance to innovation [9]. IRT focuses on explaining consumer reactions to each product in terms of barriers, such as use barriers, value barriers, risk barriers, traditional barriers, and image barriers [10].

Usage Barrier

Usage Barrier are defined as resistance to innovation due to inconsistency with the lives and daily habits of today's consumers. Innovations based on established processes and consumer preferences for products also need to offer significant benefits in order to be accepted. It takes a long time to innovate to meet and accept customer demands because consumer habits need to be adjusted [11].

Value Barrier

A value barrier is the refusal to use a product or service if it does not match the user's perception of value/performance/price. The small perceived value impact of mobile retailers' willingness to recruit in Malaysia suggests that value barriers are negatively related to recruitment intentions [12].

Risk Barrier

Risk barriers are inherent uncertainties and require innovation [10]. It also represents consumers' perceptions of the risks associated with the use of inventions. There is a significant negative relationship between intention to use new technology products and perceived risk. Another quantitative study measured the impact of reluctance to innovate among Malaysian banking customers. Based on

these results, it is concluded that risk awareness has a negative impact on online banking adoption in Malaysia [13].

Tradition Barrier

Tradition Barrier are barriers that arise when innovation makes a difference to established or typically existing traditional customers [10] . The more conflicts, the stronger the resistance. When technological advances change customer traditions, traditional barriers arise. According to a 2013 survey by Lian & Yen, traditional barriers are a significant barrier to people's refusal to purchase experiential products online [14].

Image Barrier

Image Barriers are individuals' negative thoughts about technical tools and the perceived complexity of using them [10] . The image barrier to new innovations comes from negative things. Image of a common "complex" internet channel. A study which showed that perceived image barriers were negatively related to innovation acceptance [15].

Usage Intention

Usage Intention of use focuses on the results of a set of variables intended to indicate that consumers are willing to take certain actions [10]. Based on previous research, the intention to use or the intent to use is the "strength" of the intention of people who take certain decision-making actions. Functional and psychological barriers have a negative impact on customers' intention to use [16].

III. METHODOLOGY

This chapter describes the methods used by researchers in this study. Describes the survey method, target population, location, sample size, sampling method, data collection method, and data analysis used.

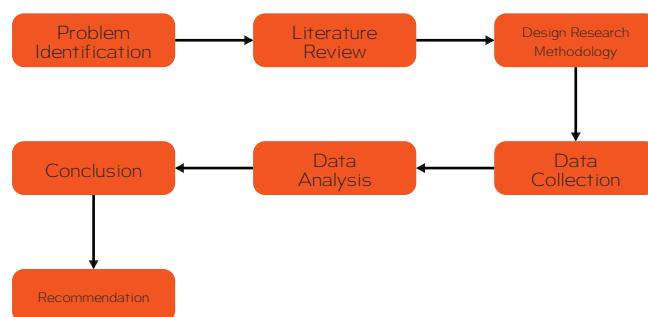


Figure 4. Research Design

Qualitative Approach

The author takes a qualitative approach to gain broad insight and experience on the problem of this research. The qualitative approach [17] is an unstructured exploration method , which relies on a small sample to provide broad insight and awareness of the problem at hand. Qualitative methods recognize that the study of people's lives, personalities, and experiences involves inevitable contradictions and the existence of parallel and contradictory truths. "Cleaning up" these individual differences data requires some choice and choice, and a more subjective measure.

Method

This survey using in-depth interviews. It consists of a series of free-form questions about a problem or topic which the author wants to discuss. The ability to add new questions and clues throughout the interview session is one of the benefits that the authors derive from this method [18]

Sampling Strategy

Population and sample

The sample selection method is purposive sampling method, namely the selection of samples based on the characteristics of the sample and does not require a minimum number of samples and the sample selection technique is adjusted to the needs of the study, namely the in-depth interview method. Purwanti [19] shows that 10 respondents can answer the research and reach saturation. In this in-depth interview method, 10 people who live in Pekanbaru become informants and have received treatment at least once at a beauty clinic in Pekanbaru, aged between 18 and 64 years. We chose this demographic sample because this study aims to identify the inhibiting factors of patients at the Pekanbaru Beauty Clinic that affect their intention to queue online through an online platform.

Sampling Method

This qualitative approach uses a non-probability-based sampling strategy. It refers to a form of discreet sampling where population items were deliberately selected at the discretion of the researcher. If you don't need population-wide reasoning, you can say it's cheap, convenient, fast, and useful [17]. This includes the development of a framework from variables that can influence individual contributions, based on the researcher's practical knowledge about the field of study, available literature, and evidence from the research itself.

Interview Procedure

This non-standard interview consists of several exploratory questions to gain comprehensive insight. The following is a list of questions asked to respondents.

People who live in Pekanbaru and have had treatment at a Pekanbaru beauty clinic, at least 1 time.

1. What is the detailed process for you to take the queue number at the beauty clinic so far?
2. How do you feel?
3. Are you familiar with online platforms for taking the queue numbers at beauty clinics?
4. Why don't you use the online platform to take the queue number at the beauty clinic?
5. What are your expectations regarding the online platform for taking the queue numbers at beauty clinics?

Data analysis

Qualitative study on method Grounded Theory (GTM) demonstrates the diversity and flexibility of data coding approaches [20]. It can be divided into three levels: open, axial, and selective coding . This coding approach can identify, define, and interpret key themes, contribute to the literature, and support the research focus. Therefore, the authors of this study chose this method.

1. Open coding requires you to define, label, and develop categories based on dimensions and attributes. It is the first level of data organization and creates a broad subject area for the data set. Axial coding further refines, directs, and categorizes subjects.
2. Axial coding is used to generate core code by identifying the relationship between open codes. (Strauss and Corbin, 2000)
3. Selective Coding is a third-level coding that allows the researcher to choose data categories sorted from axial coding and integrating them into something consistent and meaningful.

IV. (EXPECTED) FINDINGS AND DISCUSSION

Table 1 - Characteristics of Respondents

Respondent	Age	Gender	Occupation
Respondent 1	22	Female	Honorary Staff
Respondent 2	21	Female	College Student
Respondent 3	21	Male	College Student
Respondent 4	24	Female	Honorary Staff
Respondent 5	21	Female	College Student
Respondent 6	29	Female	Private Sector Employee
Respondent 7	27	Female	Government Employees
Respondent 8	18	Male	College Student
Respondent 9	55	Female	Housewife
Respondent 10	56	Female	Housewife

From the broad responses that have been explored in open coding , the authors further categorize "keywords" with axial coding techniques. The results are shown in table below.

Table 2 - Axial Coding

No	Selective Themes	Categories	Proof Clauses
1		Difficulties to use/ operate	"Difficult to use, because I understand and don't know the function of each flow"
2	Usage Barrier	Convenience	"There are many risk concerns that make it uncomfortable", "must be comfortable with the platform first".
3		Network/server Problems	"The internet can be slow and the server can crash unexpectedly".
4		Usage flow is not clear	"No detailed flow provides tutorials"

Table 2 - Axial Coding

No	Selective Themes	Categories	Proof Clauses
5	Value Barrier	Necessity	<i>"Haven't seen any urgency", "felt like I didn't need it".</i>
6		The function is not implemented properly by the clinic.	<i>"Depending on the institution that realizes and operates it", "the institution is less focused on managing queues".</i>
7	Risk Barrier	Data privacy risk	<i>"Afraid of account being hacked", "don't want to provide personal data if the benefits are not worth it".</i>
8		Fraud Risk	<i>"Afraid of being ripped off"</i>
9	Tradition Barrier	Face-to-face Interaction	<i>"I'm used to coming directly to the clinic", "prefers two-way communication with the admin".</i>
10		Inclination to current behavior	<i>"It's comfortable with current behavior and processes."</i>
11	Image Barrier	Skepticism	<i>"Still indoctrinated with a negative image that makes it hesitant to use".</i>
12		Unwillingness for complexity	<i>"I prefer simple and uncomplicated"</i>

Based on the Innovation Resistance Theory (IRT) framework, the barriers are divided into 5, namely, Usage Barrier, Value Barrier, Risk Barrier, Tradition Barrier, and Image Barrier. The results showed that the variables used in previous studies were in accordance with the people in Pekanbaru, so that these variables can be said to be validated with different target markets. Difficulties to use/operate, Convenience, Network/server Problems, and Usage flow is not clear can be categorized into Usage Barriers. Necessity and The function is not implemented properly by the clinic can be categorized into Value Barrier. Data privacy risk and Fraud Risk can be categorized into a Risk Barrier. Face-to-face interaction and Inclination to current behavior can be categorized into Tradition Barriers. Skepticism and Unwillingness for complexity can be categorized into Image Barrier.

- Regarding the Usage Barrier, if the use of the improved product is not in accordance with the ease of use perceived by the consumer, then the consumer will take a long time to accept the innovation. And also obstacles related to flow that are less clear have an effect on usage intention. 2 of the in-depth interview respondents stated that their difficulty in using the online platform is influenced by the age above 50 years. They may face confusion regarding the use of the online platform and the progress of taking queues online.
- Regarding the Value Barrier, people in Pekanbaru dominantly feel that they need to switch from taking offline queues to taking online queues because it provides benefits such as saving time and energy. One of the interview respondents said that, it returned to the implementation of the online platform at the beauty clinic, whether it went well so as to be able to manage the queue or not. Therefore, the value barrier is not a significant barrier for them to adopt online platforms.
- Regarding Risk Barrier, by definition, a risk barrier is any way of showing the public about the risks involved with product or service innovation. Risk barriers in this context are the fear of entering incorrect information in the process of retrieving queue numbers, the fear of losing usernames and passwords, and the fear among users about the risks that come from sharing details of the process of using online platforms. The perceived risk arises because of the lack of information they know about taking queue numbers at beauty clinics so that they do not trust online platforms to handle their personal information. This can be explained by the fact that the demographics of this study were 6/10 respondents aged 18-24 years, and surveys to prove that Gen Z is less worried about risk than previous generations worried about risk.
- Regarding Tradition Barrier proved to be a significant variable that affects the intention to use. 10/10 respondents make tradition barriers an obstacle not to use online platforms. The findings of this study are in line with Lian and Yen (2013) and Laukkanen et al (2007) which produced similar results. Traditional barriers are a type of psychological resistance that results from changes in consumer culture created by innovation. Respondents still prefer the culture of coming to the beauty clinic directly rather than taking a queue number using an online platform. They are accustomed to face-to-face interactions and provide information verbally to administrators. That is, this barrier is one of the most prominent barriers that prevent them from using online platforms in taking queue numbers at beauty clinics.

5. Regarding Image Barrier, Image Barrier implies that a negative impression is created due to the perception of complications in using the product. However, this study states that respondents do not hesitate to use online platforms to take queue numbers at beauty clinics even though the new technology is often given a negative image that is complicated. This can be explained by the fact that the demographics of the questionnaire research 4/10 respondents are students aged 18-21 years who have been educated about online platforms so that increasing consumer awareness about the simplicity of the newly implemented technology does not create a negative image. However, 2/10 respondents over the age of 50 said they were doubtful because they were projected negatively by others about the complexity of use.

V. CONCLUSION

In short, this research provides solutions to all research questions and objectives. What are the obstacle factors that affect the patient's intention to take a queue number at a beauty clinic. The findings obtained in this study indicate that there are similar obstacles from previous studies with research conducted with different samples, namely in Pekanbaru Riau. IRT focuses on explaining consumer reactions to each product in terms of barriers including usage barriers, value barriers, risk barriers, tradition barriers, and image barriers [10]. And what stands out the most is the tradition barrier because there are still changes in traditional traditions that affect the patient's intention to come directly to the beauty clinic. Tradition Barrier has a significant effect on the intention to use online platforms in taking queue numbers. Respondents still prefer the culture of coming to the beauty clinic directly rather than taking a queue number using an online platform.

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Paper 3

The Influence of Social Media Content Types Towards Social Media Engagement among Flashy Potential Customer

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ICMEM

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Abstract - The emergence of Covid-19 in Indonesia increases the competition between fashion brand in attracting potential customer on social media. In this challenging time where the potential customers treated by massive advertising and aggressive campaign, it has become important for brands to have strong social media engagement. One of the important aspects that affect social media engagement is content marketing. Which the relevant content marketing could attract the audience to engage and create positive attitudes toward the brand. Unfortunately, there are still a lot of Indonesia local fashion brand that still struggling to increase and maintain their social media engagement. One of the reasons is caused by lack of audience research especially on audience social media content preferences. Therefore, this research studies the influence of social media content types towards social media engagement to help one of local Indonesia fashion brand that struggling with their social media engagement performance.

This research conducted in Multiple Regression Analysis. The population observed is Flashy potential customer with sample size of 253 respondents. The results of this research showed a significant influence of informational content, entertainment content, remunerative content, and relational content on social media engagement. The most influential content types are entertainment and relational content. Therefore, researcher recommend Flashy the local women fashion brand to put more effort on creating all the four social media content types, especially entertainment and relational content. Because these content types have a strong effect on social media engagement of Flashy potential customer.

Keywords - Local Brand, Social Media Engagement, Social Media Content, Social Media Strategy

I. INTRODUCTION

Fashion industry is the second largest creative industry in Indonesia that contribute 17.26% to creative industry GDP and growth rapidly in recent years. Unfortunately, the emergence of Covid-19 pandemic in Indonesia causes this industry to face difficult times. It affects many local fashion brands experiencing business losses and significant sales decline [1].

The effect of Covid-19 also causes changing of consumer behavior especially on online transaction. This situation responded by many local fashion brands shift their focus

to sell products on online platforms. However, it affects the competition among local fashion brands to be more complex and dynamics [2].

One example of local fashion brand that affected from this situation is Flashy. The local women fashion brand that established in 1998 from Bandung, Indonesia is experiencing the declining on their Instagram engagement. The brand that has 118K followers faced a difficult time on the period of December 2021 – March 2022 which their accounts engaged decreased -32% and post interaction -44.7%. This become an important issue that should be solved by Flashy to compete optimally on social media platform.

Social media engagement is an important factor in the activities of a brand because it could have an impact on how the customers interacts intellectually and emotionally with the brands. Social media engagement also can be the main basis for someone to make a product purchases [3]. Customer engagement also affects brand awareness, electronic word of mouth, purchase intention, and overall satisfaction towards the brand [4].

One way to get people interested and engaged on social media is by utilizing content marketing. This can happen if content marketing can be made resonate and relevant to customers [4]. Which if the audience interested with the social media content they will engaged in the form of likes, comments, or shares [5].

However, because of the Covid-19 pandemic Flashy have a difficulty to analyze their social media audiences. They did not have a proper capability to find out the content preferences of their potential customer. Therefore, researcher will try to explore the social media behavior and content preferences of Flashy potential customers. The research will adapt the uses and gratification theory as a basis to determine the content types. There are four content types included which are informational, entertainment, remunerative, and relational content types. Which the result can be used by Flashy to create relevant content as an effort to increase their social media engagement performance.

II. LITERATURE REVIEW

Content marketing is an approach for a specific target audience by creating and distributing valuable, consistent, and relevant content through digital media to achieve

business goals. The right content marketing can increase consumer engagement, brand awareness, audience traffic, and sales [6].

Content marketing is a strategy that needs to be adapted to the characteristics of the audience and the purpose of the content. Which each audience has a different motivation and interest towards content that posted. Therefore, a brand in social media needs to do research related to their audience preferences so that the content marketing strategy can be effective in generating high amount of social media engagement [7].

The uses and gratification theory approach in content marketing provides a lot of insight into how someone is motivated and engaged in consuming social media content. Which this theory explains that someone can engage because there is gratification that make users gets based on what they seek [8]. In this research, the researcher uses four content types from previous research related to uses and gratification theory. Which the content types provide gratification from several perspectives. This content types are also used because it is in accordance with the context of research object from Flashy business. The content types are informational content, entertainment content, remunerative content, and relational content.

A. Informational Content

Informational content is the extent to which social media content offers consumers with useful and valuable information. The context of information can be related to the brand, product, price, purchase instruction, or other matters relevant to the brand information [7]. Customers seek out informational content in social media because it can provide an instant gratification for audiences that are motivated to find specific information [9]. Therefore, the first hypothesis was developed:

H1: Informational content has a positive and significant effect on social media engagement.

B. Entertainment Content

Entertainment content refers to the content that could make the audience enjoy and feel the pleasure of joy. This content usually gives the impression of content that is exciting, fun, or even provides a humor that can attract the attention of the audience directly [10]. Which it becomes the contents that is important in attracting the audiences, especially for people who seek gratuities that can entertain them [7]. Thus, the second hypothesis developed:

H2: Entertainment content has a positive and significant effect on social media engagement.

C. Remunerative Content

Remunerative content is a type of content in social media that has the characteristics of providing financial, incentive, or reward benefits for its audiences [7]. Remunerative content could make customers engage in social media because it can fulfill the economic benefits they are looking for or their personal desire to get profitable benefits [11]. Therefore, the hypothesis was developed:

H3: Remunerative content has a positive and significant effect on social media engagement.

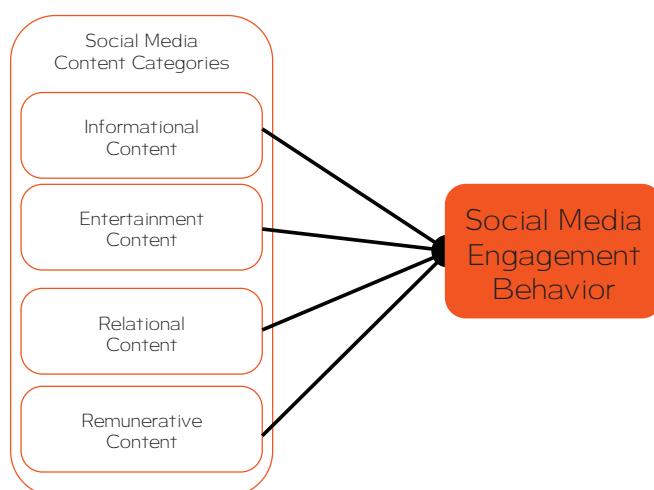
D. Relational Content

Relational content refers to the content that provides an emotional connection between the content and the audience [7]. Content like this makes the audience feel relatable because it gives social gratification that fulfill users' needs. Usually, relational content contains content such as discussion, feedback, and expressing opinions [9]. Thus, last hypothesis was developed:

H4: Relational content has a positive and significant effect on social media engagement.

E. Social Media Engagement Behavior

Social media engagement behavior is mostly defined by researchers as a user's activity in social media when interacting emotionally and intellectually [3]. Social media engagement is an indication that someone not only consumes but also interested on the content. Social media engagement could create positive or negative attitudes towards the content. It is mostly measured by the number of likes, comments, or shares on content that posted in social media. Social media engagement also very interrelated with social media content types in attracting audiences to engage [7]. Therefore, below is the conceptual model that was used in this study:



Conceptual Model (Dolan, 2016)

III. METHODOLOGY

This research is aimed at exploring social media behavior, especially content preferences of Flashy's target market through a quantitative method. Online survey is used as a data collection method because it is easy to distribute and less time consuming. This research uses purposive sampling where respondents are searched according to the criteria for research needs.

The minimum sample will follow the sample size criteria that stated by [12], which the minimum 200 sample size is needed for marketing research. Researcher selects the population that aligns with Flashy's target market as the main subject in this study. The population is focused on female with age from 18 to 34 years old, social media users, likes to shopping online, and live in Bandung or Jabodetabek area.

The questionnaire has been created by following various previous research and developed through peer review with the academicians. The pilot test was also conducted to make sure the questionnaire is valid and reliable for large scale surveys. The result of the online survey has gathered 253 respondents who have met the required respondent criteria.

The data that have been gathered were analyzed using the SPSS 25 application to process statistical data analysis. The analysis process begins with a classical assumption test consisting of linearity, multicollinearity, heteroscedasticity, and normality tests. After that if the data is passed the classical assumption test, then data can be continued for the multiple linear regression process to find out the relationship between the independent and dependent variables.

IV. FINDINGS AND DISCUSSION

A. Respondent Profile

The data that have been collected resulted 253 female respondents. The respondents mostly from age between 20-24 (47%), followed with 25-29 (29%), 15-19 (34%) and 30-34 (11%). In terms of geographical location, the respondents mostly dominated from Bandung with 116 respondents (46%) followed with Jakarta 73 respondents (29%) Bodetabek area with 46 respondents (18%) and from others area with 18 respondents (7%).

All respondents are like to shopping fashion products through various online platforms. Mostly the respondents purchase fashion products through Indonesia e-commerce platforms such as Shopee (90.12%), Tokopedia (46.64%) and Lazada (17%). There are also respondents who have bought fashion products through the official webstore of the brand (41.9%) and through social media Instagram

(20.55%). Which this shows that the respondents are quite diverse in their preferences on buying products through online platform.

In terms of social media behavior, all respondents actively use social media. Which mostly use Instagram (97.63%), TikTok (67.59%), YouTube (47.43%), Twitter (40.32%), and Facebook (34.78%). Which the most used platforms are Instagram and TikTok. This becomes an important insight for Flashy to focused on popular platforms that mostly used by their potential customers.

Respondents are also actively using social media daily. They mostly open social media several times in a day (68%), only a few times a day (31%), and very rarely use social media (1%). Which shows that the respondents are active social media users that align with Flashy target market criteria.

In social media, respondents mostly spend their time to see short-video content format (57.31%) such as reels, Instastory, etc. There are also respondents who spend more time on Images content format such as images post (40.32%). Even so, there are also respondents who prefer to spend time watching long-video content formats such as live and IGTV (2.37%).

The results of the online survey show that the respondent's profile aligns with the criteria of Flashy potential customers. Which the respondents are female, age between 15-34, live in Bandung or Jabodetabek area, likes to shop online, and active using social media. This is in line with the research objectives and can provide important insights for Flashy.

In terms of social media behavior, the results from the online survey also provide a lot of insight regarding social media platforms and content formats that mostly viewed by the respondent when using social media. Which Instagram and TikTok are the most used platforms by the respondents. The respondents also mostly spend time watching short-video content format compared to image content format. Which shows that it is important to develop Instagram and TikTok account to interact with potential customers. It also important to create short video content to fulfill the demand from certain potential customer.

B. Reliability

Reliability test is used to test the consistency of the measuring instrument. The unreliable questionnaire instrument is inconsistent for measurement so that the measurement results cannot be trusted. If a research data has met the aspects of reliability, then the data is feasible and can be further tested statistically.

Table I. Reliability Test Result

Variable	Cronbach's Alpha
Informational Content (INF)	0.742
Entertainment Content (ENT)	0.867
Remunerative Content (RMT)	0.899
Relational Content (RLT)	0.843
Social Media Engagement (SME)	0.958

Source: Survey Data

c. Classical Assumption Test

- o Linearity

The linearity test is used to determine whether the independent variable and dependent variable has a linear relationship. If the deviation from linearity > 0.05 then there is a linear relationship between independent variable and dependent variable. The result on Table II shows that all the independent variable in this research is linear.

Table II. Linearity Test Result

Variable	Deviation from Linearity
INF - SME	0.729
ENT - SME	0.188
RMT - SME	0.674
RLT - SME	0.618

- o Multicollinearity

Multicollinearity is the tests to know if there is a correlation between the independent variables. The multicollinearity test can be seen by looking at the VIF value. If the VIF value is <10 then the data has no multicollinearity. The results Table III shows there is no multicollinearity in this data because all variable has VIF<10.

Table III. Multicollinearity Test Result

Variable	VIF
Informational Content (INF)	2.043
Entertainment Content (ENT)	1.936
Remunerative Content (RMT)	1.938
Relational Content (RLT)	1.871

Source: Survey Data

- o Heteroscedasticity

Heteroscedasticity tested using Glejser test to know if the data has unequal variance or not. If the significance value > 0.05 then the variables did not have a heteroscedasticity problem. The result on Table IV shows that the data did not have heteroscedasticity.

Table IV. Multicollinearity Test Result

Variable	Sig
Informational Content (INF)	.099
Entertainment Content (ENT)	.566
Remunerative Content (RMT)	.823
Relational Content (RLT)	.793

Source: Survey Data

- o Normality

Research data can be categorized as good data if it has normality. Normality tested using the Kolmogorov-Smirnov method by looking at the Asymp.Sig value with standardized residual data. If the Asymp.Sig value > 0.05 then the data can be categorized as normal data. The result on Table V shows that the data is normal distributed.

Table V. Normality Test Result

Standardized Residual
Cronbach's Alpha

Source: Survey Data

D. Multiple Linear Regression

The results of the regression analysis shows that the R-Square value is 0.759 or can also be interpreted as 75.9%. These results indicate that the independent variables that consist of Informational Content, Entertainment Content, Remunerative Content, and Relational Content have an effect of 75.9% on social media engagement. On the other hand, the other value of 24.1% indicates that social media engagement is not only influenced by independent variables that analyzed but also by other factors that are not explained in the research.

Table VI. R-Square Result

R	R Square	Adjusted R Square	Std. Error of the Estimate
.871	.759	Cronbach's Alpha	6.19219

The hypothesis can be accepted if the t-value is higher than the t-table and the value of significance is lower than 0.05. In this analysis the researcher uses a total of 253 respondents with a significant level of 5 percent which the t-table is equal to 1.969. The result on Table ?? shows that all the independent variables has meet the criteria and positively influence the dependent variable. The strongest variables are Entertainment Content with Beta value .389 and followed by Relational Content with Beta value .289.

Table VII. Multiple Linear Regression Result

Predictor	Coefficient			
	Unstandardized B	Standardized Coefficient Beta	t	Sig
(Constant)	7.132		3.485	.001
Informational	.781	.196	4.404	.000
Entertainment	1.603	.389	8.959	.000
Remunerative	.660	.167	3.839	.000
Relational	1.175	.289	6.776	.000

Dependent Variable: Social Media Engagement

The results of the regression analysis can also be formed an equation model from the values that have been obtained. Multiple regression equations can be formed through the value (BETA) of each independent variable and dependent variable following the estimated regression:

$$Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 \quad (1)$$

Y_i = Social Media Engagement (SME);
 $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ = Estimated Regression Coefficients;
 x_1 = Informational Content (INF);
 x_2 = Entertainment Content (ENT);
 x_3 = Remunerative Content (RMT);
 x_4 = Relational Content (RLT).

Based on the output of regression analysis, the regression model can be developed as follows:

$$\text{SME} = 7.132 + 0.781 x_1 + 1.603 x_2 + 0.669 x_3 + 1.175 x_4 \quad (2)$$

SME is the expected value of social media engagement when all independent variables are equal to zero. Each value increase on Informational Content (x_1) it is predicted 0.781 value will increase in social media engagement. Each value increase on Entertainment Content (x_2) it is predicted 1.603 value will increase in social media engagement. Each value increase on Remunerative content (x_3) it is predicted 0.669 value will increase in social media engagement. And lastly, each value increase on Relational content (x_4) it is predicted 1.175 value will increase in social media engagement.

It can be concluded that all the hypotheses on this research are accepted. Which the informational content, entertainment content, remunerative content, and relational content are positively effect on social media engagement. The strongest influences are from entertainment content and relational content, which this becomes an important insight for brand such as Flashy to use it as consideration in creating social media content.

Table VIII. Hypothesis Result

Hypothesis	Result
H1: Informational content has a positive and significant effect on social media engagement.	Accepted
H2: Entertainment content has a positive and significant effect on social media engagement.	Accepted
H3: Remunerative content has a positive and significant effect on social media engagement.	Accepted
H4: Relational content has a positive and significant effect on social media engagement.	Accepted

E. Content Marketing Strategy

The results of the content types preferences that have been found give author an insight for what kind of content that can be implemented for Flashy. Therefore, the author tries to formulate a content marketing strategy that can be implemented by Flashy directly. Which the content has been adjusted to Flashy's brand positioning and the characteristics of Flashy's potential customers. Broadly speaking, the proposed content is divided into two categories according to the content types that have the biggest and most significant influence on social media engagement, namely entertainment and relational content.

- o Utilize Internal Brand Stories

Flashy can utilize their internal brand stories to be made as one of the relational contents. By utilizing internal stories owned by Flashy, they can tell stories about their brand from an internal perspective. This will be useful to make audiences have a deeper relationship with the Flashy brand. Examples of such content are like introducing Flashy's team members or the business processes that Flashy runs in an interesting way.



Fig. 1. Example of Utilize Internal Flashy Brand Stories Content

- o Thematic Product Introduction

Flashy is very active in bringing out new products, this momentum should be used to provide product introductions with entertainment content. Where Flashy can use a thematic approach to introduce its products. The author suggests thematic content that is relevant to Flashy products such as traveling or picnics. Which this can make the product introduction more interesting and well delivered with entertaining approach.



Fig. 2. Example of Thematic Product Introduction Content

- o Utilize Loyal Customer Feedback

Flashy is a brand that already have high number of loyal customers. Therefore, author suggest Flashy to utilize its loyal customer feedback as one of the relational contents. Which the objectives are to influence potential customers with actual feedback from Flashy loyal customers. It's also a way to maintain relationship between Flashy with their loyal customer to be part in Flashy content creation.



Fig. 3. Example of Utilize Loyal Customer Feedback Content

- o A Day in The Life with Flashy Products

Flashy product is unique which it can be used by various people with different professions and backgrounds. Therefore, the researcher suggests Flashy to create a content a day in the life with Flashy products to show how Flashy products can be used in various daily activities. This content is also a relational content that can show the relatedness of Flashy products in various activities that potential customers do to increase the content interaction.



Fig. 4. Example of A Day in The Life with Flashy Products

- o Recreation of Relevant Entertainment Viral Content

Currently, viral content is an important content aspect in social media. Therefore, the researcher also suggests Flashy to be able to recreate relevant entertainment viral content so that Flashy can follow the existing trend. This can also make Flashy content more varied and interesting for the audience to see. Example of the recreation such as styling tips and trick that previously viral on social media.



Fig. 5. Example of Recreation Relevant Entertainment Viral Content

V. CONCLUSION

Social media engagement is an important factor for brands to establish deeper relationships with audiences and also give various benefit. Currently, Flashy, one of the women's fashion brands, has experienced a significant decline of social media engagement on their Instagram account. Therefore, the researcher tries to help them by exploring Flashy potential customers in terms of their social media behavior and content preferences through an online survey.

The result of this research shows that informational content, entertainment content, remunerative content, and relational content positively affect social media engagement with the value of 75.9%. All the content types are important factors that could affect social media engagement from Flashy's potential customer. Even so, there are two content types that have a greater influence than others, namely entertainment content and relational content types. Therefore, Flashy should focus more on creating these types of content as an effort to increase their social media engagement performance.

Flashy can create entertainment content that relevant to their women fashion brand context. Researcher recommends entertainment content such as styling tips and trick and product introduction with thematic campaign. Flashy also can create relational content types by utilizing their internal brand stories, loyal customer feedback, and a day in the life content to create relatedness with the potential customer. Which the objectives to create more engaging content to increase the interaction of audiences.

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Paper 4

Analyzing Customer Intention to Continuously Use
Starbucks Indonesia as a Branded Mobile Food Ordering
App

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ICMEM

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Abstract - The use of mobile food ordering apps has given rise to several comparisons of experience, levels of satisfaction, and the intention to use them continuously for customers in Indonesia. This research aims to identify factors that influence customers' continuous usage intention on branded mobile food ordering app, with Starbucks Indonesia as the research object that will be tested in this research. A quantitative approach using an online survey was conducted with 89 respondents that have experienced using Starbucks Indonesia mobile app within the last one month. Several hypotheses that are accepted include performance expectancy, effort expectancy, and hedonic motivation towards e-satisfaction; e-satisfaction towards habit; as well as facilitating conditions, price value, and habit towards continuous usage intention. Starbucks Indonesia is suggested to improve its application performance from the technological aspects and ease of access, expand the scope of mobile order and delivery service, improve customer service performance, as well as provide more attractive offers to increase customer satisfaction and the intention to continually use the app.

Keywords - Branded Mobile Food Ordering Apps, Continuous Usage Intention, Starbucks Indonesia

I. INTRODUCTION

In this highly digitalized era, the use of smartphones is increasing rapidly, thus encouraging the use of various kinds of mobile apps that support user performance in operating smartphones. Mobile apps play an important role in people's daily life because mobile apps can make people's activities easier with just one click away. According to [1], almost 49% of people open mobile apps more than 11 times per day. The daily usage of mobile apps makes people more dependent since everything that is usually found in physical state has been provided inside the app, ranging from social networking, entertainment, marketplace and even lifestyle. Furthermore, the convenience and simplicity feature available in mobile apps provide vast opportunities for companies and brands to build their own apps so that they can deliver their information to mass people more easily and efficiently without time and space limitation [2], as well as increase sales digitally. Besides, with the current trends of branded mobile apps, companies are able to implement customer relationship management that later increases customer engagement [3], so it makes customers continue using the app and they will recommend others to use the app.

One of the industries that is starting to use digitalization methods in running its business ecosystem is the food industry [4]. The online ordering and payment, as well as data processing in mobile apps for food businesses have massively improved customer's ordering experiences and boosted technological development of the brand. The mobile apps that people download to be used as a convenient medium to see food menus, make orders and payment without having a physical interaction with the restaurant crew is generally known as the mobile food ordering apps (MFOAs) [5]. In Indonesia, there is an increase of 19.1 million of users that use mobile food ordering apps by 2020 and this number is also predicted to keep increasing until 2024. Data also shows that the number of users of first-party mobile apps owned directly by a restaurant is 27.5 million, which is higher than the number of third-party mobile apps users that only reach 22.7 million [6]. Besides, the high percentage of mobile food ordering and delivery apps users in Indonesia also come from early adulthood, by 87.3% of users aged 17-24 years, 90.3% aged 25-29 years, and 89.0% aged 30-34 years old [7].

The use of mobile food ordering apps provides good prospects for a brand to increase its exposure and build a new experience for customers in ordering food digitally. This type of mobile app that is built by a brand itself to promote and sell products or services within the brand without involving a third party is called a branded mobile application. In contrast to third-party apps, a branded mobile app is a platform that can be installed mobilely that presents brand identity such as a brand name and logo, and provides an experience that is tailored to the brand's personality [8]. By seeing the existence of the Indonesian version of branded mobile food ordering apps, this research will focus on Starbucks Indonesia, since Starbucks is continuing to invest in technology and keep increasing its digital ratification to afford amenity and boost the customer experience [9]. Starbucks mobile app is aligned closely with a rapid shifting in customer behavior and tendency, such as greater interest in mobile ordering, higher demand in contactless services and high desire to avoid in-store queues that aimed at implementing physical distancing regulations optimally [9].

However, Starbucks Indonesia still has ratings below average, which is 2.2 on App Store. Starbucks Indonesia also has numerous bad reviews regarding the use of the app from the users' perspectives. Most of the reviews

show that the users are complaining about problems when registering an account and logging in, difficulties when ordering, and application malfunctions. A preliminary study conducted by the researcher also shows that the majority of respondents stated that the layout of the app is not consistent, less proportional, does not represent the perception of a 'high-class' brand because of the basic appearance of the app, often experienced errors, lost connections, and some features did not work. Besides, there is a high unsatisfaction rate comes from Starbucks Indonesia users. This high level of unsatisfaction and bad reviews can affect customers' future intention to use the app continuously. Therefore, this research aims to analyze the factors that influence customers' continuous usage intention on Starbucks Indonesia and provide recommendations that can be implemented by Starbucks to improve their mobile apps in Indonesia.

There are numerous studies that discuss factors or constructs in mobile apps related to food ordering and delivery that influence customers' continuous usage intention to the apps. To narrow the research according to the features available in Starbucks Indonesia, the researchers used different independent factors adopted from [5]. These factors include performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, e-satisfaction, and habit [5].

In supporting the current research, the researcher found out that satisfaction is one of the most important factors to influence continuous purchase and usage [10]. In the context of online food ordering and delivery platforms, user satisfaction towards the platform has a direct influence on the continuous usage intention of the user [11]. Other than satisfaction, brands have to consider how strongly their users decide to continue their use in the platform by looking up at their previous experiences in using the platform [12]. Users are likely to have a good experience in using a platform if the platform delivers a friendly interface and efficient usage performance. Still, there are a lot of correlation between the building factors inside a mobile food ordering app towards customers' continuous usage intention. Therefore, the hypotheses of this research are developed as follows.

- H1a:** Performance expectancy positively influence e-satisfaction.
- H1b:** Performance expectancy positively influence continuous usage intention.
- H2a:** Effort expectancy positively influence e-satisfaction.
- H2b:** Effort expectancy positively influence continuous usage intention.
- H3a:** Social influence positively influence e-satisfaction.
- H3b:** Social influence positively influence continuous usage intention.
- H4a:** Facilitating conditions positively influence e-satisfaction.
- H4b:** Facilitating conditions positively influence continuous usage intention.
- H5a:** Price value positively influence e-satisfaction.
- H5b:** Price value positively influence continuous usage intention.
- H6a:** Hedonic motivation positively influence e-satisfaction.
- H6b:** Hedonic motivation positively influence continuous usage intention.
- H7a:** E-satisfaction positively influence habit.
- H7b:** E-satisfaction positively influence continuous usage intention.
- H8:** Habit positively influence continuous usage intention.

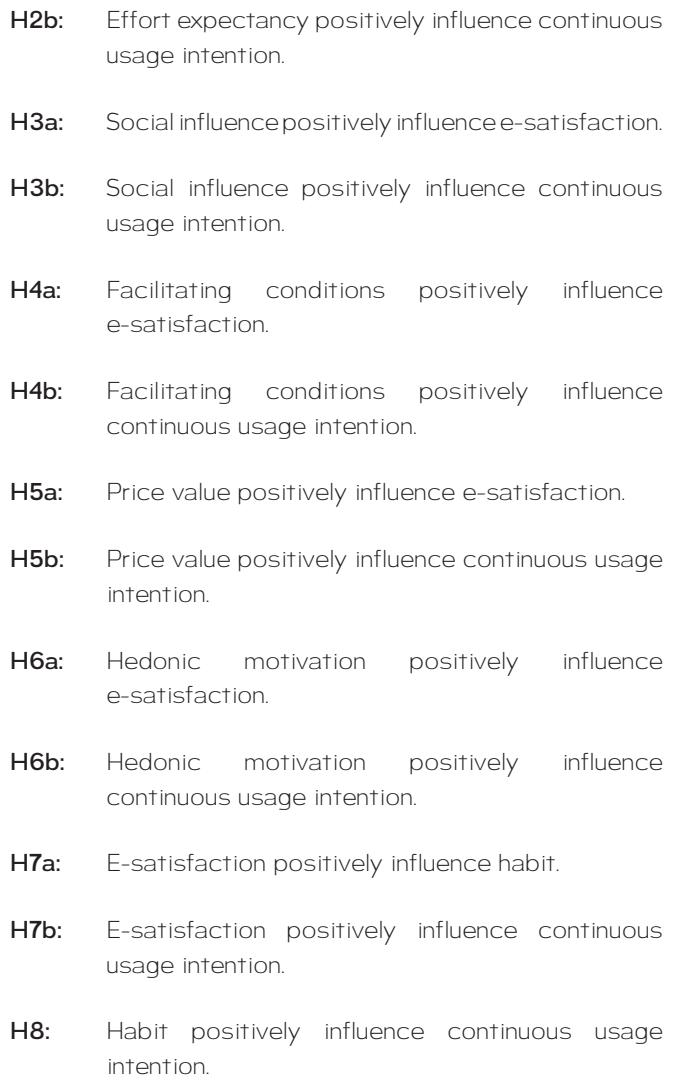


Fig. 1. Conceptual Framework Modified from Alalwan (2020)

II. METHODOLOGY

To analyze the relationships between each factor that builds Starbucks Indonesia towards the continuous intention to use, the researcher uses a quantitative approach by conducting a survey through an online questionnaire. The questionnaire will be delivered in Bahasa Indonesia as the researcher and respondents' mother tongue to facilitate both parties' understanding towards the questionnaire. The researcher uses a purposive or judgmental sampling technique and built several requirements of respondents that can participate in the questionnaire, which include the people who are aged between 17-34 years old that live in Bandung or Jakarta and have used Starbucks Indonesia within the last one month.

A five-point Likert scale will be used in the questionnaire in order to represent a more precise and reliable opinion of the respondents. The researcher will use the PLS-SEM method through the SmartPLS analytics software to analyze the data in discovering the insights related to the research topic. Since this research aims to identify which factors on Starbucks Indonesia that affects continuous usage intention of the users, thus the PLS-SEM method is appropriate to be used because the PLS-SEM method tests whether there is a relationship or influence between variables in a data set [13].

III. RESULTS

The results of demographic and behavioral questions show that the majority of respondents spend less than IDR 100,000.00 up to IDR 500,000.00 on Starbucks Indonesia in a month. This data shows that there is moderate monthly spending that people tend to set aside for ordering foods from Starbucks Indonesia. In addition, most of the respondents consider great offers as the primary consideration to use mobile food ordering app. Great offers can be in the form of food promotions, discounts, vouchers, or any other type of promotions that can be beneficial for the users of the app. Therefore, it can be concluded that the average customer will look for attractive price offers that can reduce their cost of usage in using the mobile food ordering app and also minimize their monthly expenses for food needs.

For the main data analysis, the researcher used SmartPLS software to evaluate the relationship between all variables used in this research, which include performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, e-satisfaction, habit, and continuous usage intention. There are several critical phases that must be considered before the researcher proceeds with the data analysis process. These phases include establishing indicator reliability, internal consistency reliability, convergent validity, and

discriminant validity. The built model and PLS Algorithm calculation are shown as follows.

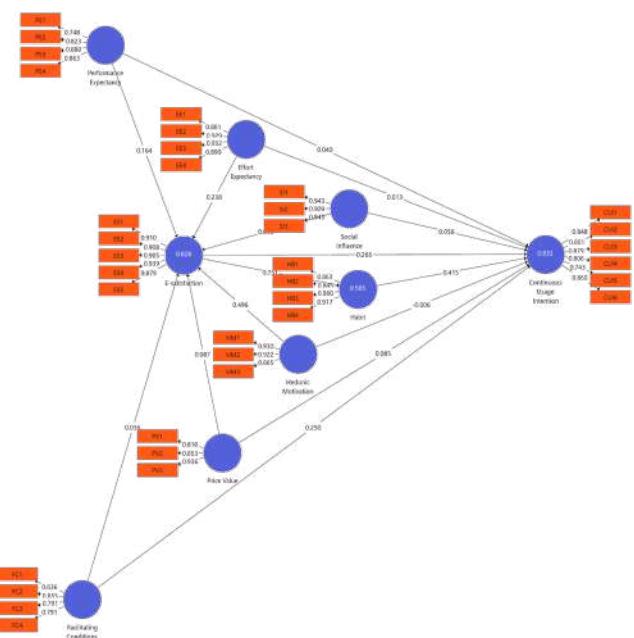


Fig. 2. PLS Algorithm Result

In order to get the significance of the data, the outer loadings value should be greater than 0.7 in the indicator reliability test [14]. However, [15] explained that if there is an outer loading value between 0.4 and 0.7, the data analysis should be strengthened by the composite reliability (CR) test and the average variance extracted (AVE) test to see whether the indicator should be removed or remains used. After conducting the indicator reliability test, the results in Table 1 shows that all of the indicators are reliable, except for indicator FC1 (0.636) because its outer loading value is less than 0.7. Therefore, to decide whether indicator FC1 should be removed or remains used, the researcher will further conduct the CR and AVE tests to assess each variable.

TABLE 1 - INDICATOR RELIABILITY RESULT

Variables	Indicators	Outer Loadings	Reliability
Performance Expectancy	PE1	0.748	Reliable
	PE2	0.823	Reliable
	PE3	0.880	Reliable
	PE4	0.863	Reliable
Effort Expectancy	EE1	0.881	Reliable
	EE2	0.929	Reliable
	EE3	0.932	Reliable
	EE4	0.890	Reliable
Social Influence	SI1	0.943	Reliable
	SI2	0.909	Reliable
	SI3	0.943	Reliable
Facilitating Conditions	FC1	0.636	Not reliable
	FC2	0.855	Reliable
	FC3	0.791	Reliable
	FC4	0.791	Reliable
Price Value	PV1	0.810	Reliable
	PV2	0.853	Reliable
	PV3	0.936	Reliable
Hedonic Motivation	HM1	0.930	Reliable
	HM2	0.922	Reliable
	HM3	0.865	Reliable
E-satisfaction	ES1	0.910	Reliable
	ES2	0.908	Reliable
	ES3	0.905	Reliable
	ES4	0.939	Reliable
	ES5	0.879	Reliable
Habit	HB1	0.863	Reliable
	HB2	0.845	Reliable
	HB3	0.860	Reliable
	HB4	0.917	Reliable
Continuous Usage Intention	CUI1	0.848	Reliable
	CUI2	0.801	Reliable
	CUI3	0.879	Reliable
	CUI4	0.806	Reliable
	CUI5	0.743	Reliable
	CUI6	0.860	Reliable

Internal consistency reliability test is conducted to see whether the answers to each indicator in the questionnaire are consistent or not, based on all of the variables. To see the reliability of the variable, the value of composite reliability must be greater than 0.7 [16]. Besides, convergent validity test is also used to examine whether a set of indicators can reflect the same underlying latent variable or not [14]. A threshold value of 0.5 in AVE can describe a sufficient convergent validity of more than half of the variance in each indicator in an average manner. Based on Table 2, all of the composite reliability values are above 0.7 and the average variance extracted (AVE) are above 0.5. Therefore, it can be stated that all of the variables are reliable and valid, indicator FC1 can also remain used for further analysis.

TABLE 2 - VALIDITY TEST RESULT

Variables	Composite Reliability	Average Variance Extracted (AVE)	Reliability
Performance Expectancy	0.898	0.689	Reliable
Effort Expectancy	0.950	0.825	Reliable
Social Influence	0.952	0.869	Reliable
Facilitating Conditions	0.854	0.596	Reliable
Price Value	0.901	0.753	Reliable
Hedonic Motivation	0.932	0.821	Reliable
E-satisfaction	0.959	0.825	Reliable
Habit	0.927	0.760	Reliable
Continuous Usage Intention	0.927	0.679	Reliable

Apart from convergent validity, discriminant validity is also used to measure the validity of a set of data. Discriminant validity has two concepts that differ from others, which are the Fornell-Larcker criterion and the cross-loadings [14]. In order to get valid data, the Fornell-Larcker criterion or the square root of AVE value must be greater than the correlations of other latent variables, which are located on the left or below the Fornell-Larcker value [14] [15]. Since there is a problem in variable continuous usage intention, then the researcher found that the indicator that has the lowest cross-loadings value in variable continuous usage intention is CUI5. Therefore, indicator CUI5 is removed and the researcher retests the discriminant validity calculation with the result presented in Table 3 below.

TABLE 3 - DISCRIMINANT VALIDITY RESULT

	PE	EE	SI	FC	PV	HM	ES	HB	CUI
PE	0.830								
EE	0.565	0.908							
SI	0.488	0.375	0.932						
FC	0.389	0.604	0.269	0.773					
PV	0.404	0.505	0.268	0.555	0.868				
HM	0.677	0.652	0.577	0.539	0.604	0.906			
ES	0.711	0.741	0.545	0.575	0.609	0.867	0.908		
HB	0.648	0.549	0.554	0.393	0.464	0.742	0.752	0.872	
CUI	0.655	0.668	0.522	0.677	0.636	0.785	0.836	0.804	0.846

Beyond discriminant validity, a heterotrait-monotrait (HTMT) ratio test is also conducted to measure the similarity between each latent variables. In order to establish a proper discriminant validity, then the HTMT value must be lower than 1.0, where most of researches have used 0.85 and 0.90 as the threshold value to calculate HTMT ratio [18]. In this research, the researcher sets the threshold value at 0.90 since the SmartPLS software will automatically generate invalid data for HTMT ratio if the value is above 0.90. The result of heterotrait-monotrait ratio in this research shows that all of the variables are valid because the values are under 0.90. Therefore, the researcher can continue the analysis to the next tests.

TABLE 4 - HETEROTRAIT-MONOTRAIT RATIO RESULT

	PE	EE	SI	FC	PV	HM	ES	HB	CUI
PE									
EE	0.629								
SI	0.544	0.400							
FC	0.434	0.650	0.272						
PV	0.477	0.574	0.301	0.676					
HM	0.779	0.713	0.641	0.583	0.696				
ES	0.791	0.788	0.582	0.610	0.683	0.843			
HB	0.741	0.596	0.611	0.416	0.529	0.822	0.806		
CUI	0.750	0.728	0.577	0.760	0.730	0.875	0.805	0.888	

A collinearity test is commonly used to evaluate or address any collinearity problem, with the variance inflation factor (VIF) as the value to demonstrate the test [16]. The preferred value of VIF is 5 or lower to avoid the collinearity problem. According to the results in Table 4, all of the indicators have met the preferred VIF value because their values are lower than 5, except for indicator ES4. Therefore, indicator ES4 is removed and the researcher retests the collinearity calculation with the result presented in Table 5.

TABLE 4 - HETEROTRAIT-MONOTRAIT RATIO RESULT

Indicators	VIF
PE1	1790
PE2	3.761
PE3	4.610
PE4	2.481
EE1	2944
EE2	4253
EE3	4304
EE4	2.776
SI1	4194
SI2	2.866
SI3	4219
FC1	1687
FC2	1769
FC3	2018
FC4	1487
PV1	1730
PV2	2392
PV3	3223
HM1	3.367
HM2	3.194
HM3	2102
ES1	4.007
ES2	3.662
ES3	3.836
ES5	3.086
HB1	2.151
HB2	2.487
HB3	2.480
HB4	3.637
CUI1	2.744
CUI2	2.032
CUI3	2.636
CUI4	2.271
CUI6	2.701

Bootstrapping method is the process to examine the relationships of each hypothesis by analyzing the inner and outer models in SmartPLS [16]. Bootstrapping will later provide a T-test to result in the path significance [14]. Through bootstrapping, the researcher is able to evaluate whether the hypotheses are accepted or rejected according to the data analysis results. The hypothesis result is based on the significance and inner model path coefficient, which is proven by the T-values, P-values, and original samples. The results of the hypothesis testing are summarized in Table 6 below.

	Structural Path	Original Sample	T-value	P-value	Result
H1a	PE → ES	0.144	2.162	0.031	Accepted
H1b	PE → CUI	0.056	0.871	0.384	Rejected
H2a	EE → ES	0.248	3.099	0.002	Accepted
H2b	EE → CUI	-0.004	0.051	0.960	Rejected
H3a	SI → ES	0.049	0.881	0.379	Rejected
H3b	SI → CUI	0.037	0.589	0.556	Rejected
H4a	FC → ES	0.016	0.260	0.795	Rejected
H4b	FC → CUI	0.299	4.502	0.000	Accepted
H5a	PV → ES	0.090	1.422	0.156	Rejected
H5b	PV → CUI	0.114	2.001	0.046	Accepted
H6a	HM → ES	0.520	6.913	0.000	Accepted
H6b	HM → CUI	0.008	0.073	0.942	Rejected
H7a	ES → HB	0.754	15.591	0.000	Accepted
H7b	ES → CUI	0.208	1.691	0.091	Rejected
H8	HB → CUI	0.416	4.574	0.000	Accepted

According to Table 6, hypotheses 1a, 2a, and 6a are accepted because they have the T-value that are greater than 1.96 at a significant level of 0.05 (5%) which are 2.162, 3.099, and 6.913 respectively. Those hypotheses also resulted in original sample values above 0. This indicates that performance expectancy, effort expectancy, and hedonic motivation have a significant and positive influence towards e-satisfaction. On the other hand, hypotheses 4b, 5b, and 8 are accepted because they have the T-value that are greater than 1.96 at a significant level of 0.05 (5%) as well, which are 4.502, 2.001, and 4.574 respectively. Those hypotheses resulted in original sample values above 0. Therefore, facilitating conditions, price value, and habit have a significant and positive influence towards continuous usage intention. Lastly, hypothesis 7a is also accepted because it has the T-value of 15.591, which is greater than 1.96 at a significant level of 0.05 (5%) and original sample value above 0. This means that e-satisfaction has a significant and positive influence towards habit.

However, the other remaining hypotheses, such as 1b (PE → CUI), 2b (EE → CUI), 3a (SI → ES), 3b (SI → CUI), 4a (FC → ES), 5a (PV → ES), 6b (HM → CUI), and 7b (ES → CUI) are rejected because their T-value are lower than 1.96 at a significant level of 0.05 (5%). Even though all of these hypotheses do

not generate significant influence towards the opposite variables, these hypotheses still resulted in a positive influence because their original sample values are above 0, except for hypothesis 2b that resulted in a negative influence towards continuous usage intention.

IV. DISCUSSION

The study conducted by [5] shows a positive result of path coefficient between performance expectancy and e-satisfaction. According to the data analysis in this research, the hypothesis testing result indicates that there is a significant and positive influence between performance expectancy and e-satisfaction. This means that a high level of functional benefits and a lot of attractive features inside the app can lead customers to be satisfied in using Starbucks Indonesia. The hypothesis testing result is contrary with the result from [5], where e-satisfaction was not significantly predicted by effort expectancy. This research resulted a significant and positive influence between effort expectancy and e-satisfaction. Effort expectancy or perception of ease in using mobile food ordering apps leads customer to be more satisfied with their experience and interaction happen inside the app [5]. This shows that Starbucks Indonesia is easy to use or easy to understand.

The results of relationship to e-satisfaction and continuous usage intention from facilitating conditions are contradictive. Previous results show that Starbucks Indonesia does not have a significant influence between facilitating conditions and e-satisfaction, but subsequent results show that Starbucks Indonesia has a significant and positive influence between facilitating conditions and continuous usage intention. This demonstrates that e-satisfaction does not play an important role as a mediating variable between facilitating conditions and continuous usage intention for Starbucks Indonesia, so that facilitating conditions can have a direct impact on continuous usage intention.

Different from the relationship between price value and e-satisfaction, Starbucks Indonesia proved to have a significant and positive impact on continuous usage intention. This situation can be happen because if Starbucks Indonesia provide good value for money consistently inside the app, customers are more likely to continuously use the app in the future, expecting that the price offered inside the app will still be beneficial. Price value is one of the main determinants of subsequent customer use in the Starbucks Indonesia app. Although the price value is categorized as a short-term consideration for using the app, Starbucks Indonesia has managed to provide other advantages in the form of point collection compared to other food apps. Starbucks Indonesia does not provide low product prices, but this point collection

can then be used by customers for further purchases in the long term. So, customers tend to continue their use on the app to redeem that points that they collect. This is the main difference between Starbucks Indonesia and other food apps, where Starbucks Indonesia can manage their own loyalty and payment systems without using a third party.

Apart from that, if the results of the hypothesis are related to the respondent's behavior, price value becomes a very important point for customers to reuse Starbucks Indonesia because the average respondent spends less than IDR 100,000.00 up to IDR 500,000.00 on Starbucks Indonesia in a month. Respondents also stated that great offers were their main consideration in using a mobile food ordering app, in this case Starbucks Indonesia. Therefore, the hypothesis that price value has a significant and positive relationship to continuous usage intention can be justified and has strong evidence.

Table 6 concludes that Starbucks Indonesia generates significant and positive influence between hedonic motivation and e-satisfaction. Hedonic motivation has proven to be crucial for customers e-satisfaction and continuous usage intention as well [5]. In this research, the result in Table 6 shows that Starbucks Indonesia succeed in providing enjoyment, fun, and feelings of pleasure for the customers. The features and functions of the app have successfully draw a good intrinsic motivation for customers whenever they use the apps to order food. When customers have a good experience inside the app, customers would also likely to be satisfied with the overall performance of the app. The hypothesis testing result concludes that Starbucks Indonesia generates significant and positive influence between e-satisfaction and habit. E-satisfaction has proven to have significant and positive impact on habit [5] [17]. In this research, the result in Table 6 shows that Starbucks Indonesia succeed in creating a pleasant experience for customers, which makes them more likely to use the app as a habit. Customers who are satisfied on their experience tend to repeat their usage on the app [5]. Starbucks Indonesia can be used as the app that shape habitual behavior because the objective is to make it easier for customers to see food menus, collect points, and get information regarding the food products.

The hypothesis testing result in Table 6 concludes that Starbucks Indonesia generates significant and positive influence between habit and continuous usage intention. The result is supported by [5] and [17] which shows that there is significant and positive influence between habit and continuous usage intention. Reference [5] stated that customers who have habitual behavior in using a system will have the intention to reuse the system again in later time, in this case mobile food ordering apps. As a conclusion, Starbucks Indonesia has successfully formed

habitual behavior to their customers, so that customers have the intention to use the app continuously in the future.

However, Starbucks Indonesia proved that there is no significant influence between performance expectancy and continuous usage intention. Although customers have a positive perception and experience of convenience in using mobile food ordering apps, it does not necessarily lead them to have the intention to continue using the app in the future. Closely, the good experiences they get while using the apps can only lead them to a sense of satisfaction. Similar to performance expectancy, Starbucks Indonesia also proved that there is no significant influence between effort expectancy and continuous usage intention, where Starbucks Indonesia also generates a negative relationship among the variables. However, this is in line with the result of [5] where continuous usage intention was not significantly predicted by effort expectancy. The ease that is felt while using the three apps does not directly indicate the customer's intention to continue using the app. The ease of use has proven to be able to provide satisfaction for customers in using the app.

Furthermore, Starbucks Indonesia does not have a significant influence between social influence and e-satisfaction, even though it still resulted in a positive relationship among the variables. The result is corresponding to [5], where there was no support to prove social influence to have an influence on e-satisfaction. Starbucks Indonesia demonstrates that its customers are less influenced by others in using the app to order food mobile. Apart from the insignificant result towards e-satisfaction, social influence is not significantly predicted continuous usage intention as well, in line with the result of [5]. Customers of Starbucks Indonesia seem to not be influenced by others' opinions or experiences to use mobile food ordering apps, in the assumption that they already understand how to use the apps by their own.

On the other hand, the mobile app of Starbucks Indonesia shows insignificant influence between facilitating conditions and e-satisfaction, even though the result still shows a positive relationship between the two variables. This can happen if customers do not have sufficient knowledge or technology in using Starbucks Indonesia mobile app which leads them to be less satisfied with the app. Apart from that, it is proven that there is no significant influence between price value and e-satisfaction for Starbucks Indonesia. The insignificant result can also be drawn if Starbucks Indonesia does not provide a reasonable price for their food and beverage products, along with great offers which can increase customer satisfaction in using the app. Therefore, there is room for improvement for Starbucks Indonesia to give better value for money inside the apps.

Different from the result of e-satisfaction, continuous usage intention variable in Starbucks Indonesia is not significantly, but still positively influenced by hedonic motivation. This result is contrary with the result of [5] that stated hedonic motivation is important to build customers e-satisfaction and continuous usage intention as well. Although customers have the feelings of enjoyment and pleasure in using Starbucks Indonesia, it does not necessarily lead them to have the intention to continue using the app in the future. In fact, this research demonstrates that the intrinsic motivation the customers get while using the app can only lead them to a sense of satisfaction. It is also proven that there is no significant influence between e-satisfaction and continuous usage intention. The feeling of content with the app does not necessarily lead customers to continuously use the app, even though it significantly leads them to have a habitual behavior in using the app.

V. CONCLUSION

This research purpose is derived from the existence of the COVID-19 pandemic that leads food brands in Indonesia, in this case Starbucks Indonesia, to adapt technological approaches through the making of mobile food ordering apps. It is important for Starbucks Indonesia to pay more attention to the factors of its mobile app that can influence customers' decisions to continuously use the app in the future. Therefore, this research aims to identify factors and how they can influence customers' continuous usage intention of Starbucks Indonesia. Furthermore, this research also aims to provide recommendations to Starbucks Indonesia about what things can be implemented by the brand to improve its mobile app in Indonesia. The primary data for this research came from online survey as the media for the quantitative approach, which is analyzed using the PLS-SEM method through SmartPLS software.

From the hypothesis testing result, there are only several factors that significantly influence continuous usage intention. The factors include facilitating conditions, price value, and habit. These factors are relevant with the objective of the mobile app of Starbucks Indonesia, especially for price value. Starbucks Indonesia provides numerous deals and offerings inside the app because the app is more intended as an application that is connected to Starbucks Card account, which contains the remaining balance and a virtual payment system rather than being used as a food ordering application. Starbucks Indonesia mobile app can be used to order food or beverage only if the customer is in the Jakarta area, so customers outside Jakarta cannot use the application to order Starbucks products on a mobile basis.

Besides, to increase customer satisfaction and further intention to continuously use mobile food ordering apps, Starbucks Indonesia has successfully create a good intrinsic motivation and feelings of enjoyment for the customers in using the app. It is more likely for customers to be satisfied with the app if they have a good experience when using the app. Other than that, Starbucks Indonesia has successfully drive a habitual behavior for customers to have a dependency towards the mobile app. As customers perceive that using Starbucks Indonesia can help fulfilling their daily needs to find food easily, it makes customers feel that using the app is a habit that will continue in the future. Thus, the awareness of these habits can shape the customer's desire to continuously use Starbucks Indonesia.

As recommendations, Starbucks Indonesia can improve the performance and appearance of applications, such as refresh rates, interfaces and navigation, to ease of access for transactions or food orders. Starbucks Indonesia can also expand the scope of ordering Starbucks products outside the Jakarta area, so that customers from all over the city in Indonesia can easily order Starbucks products without the need to order through third-party apps or come directly to the store. Furthermore, Starbucks Indonesia can improve customer service performance through the app so that customers can get easy recommendations and assistance in using the app remotely, as well as provide more attractive offers according to customer needs through the mobile app.

ACKNOWLEDGMENT

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Paper 5

The Influence of User-Generated Review Content Toward Brand Attitude and Online Purchase Intention of Local Beauty Brand Products

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ICMEM

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Abstract - Instagram is one of the most popular social media platforms for User-Generated Content (UGC) sharing, allowing users to share reviews about certain products or brands. In the context of local beauty products, this study aims to investigate the effect of User-Generated Review Content on Instagram on Brand Attitude and Online Purchase Intention. An online survey was conducted among 126 respondents and the results were analyzed using PLS-SEM method. The results show that there is a positive and significant relationship between User-Generated Review Content and Brand Attitude, Brand Attitude and Online Purchase Intention, and User-Generated Review Content and Online Purchase Intention. The results further show that Brand Attitude has a partial mediating effect in the relationship between User-Generated Review Content and Online Purchase Intention. This study suggested that local beauty product marketers should consider User-Generated Review Content as part of their marketing strategy. In addition, this study is expected to contribute to the literature of UGC, Brand Attitude, and Online Purchase Intention as well as to give an insight to local beauty product marketers regarding the utilization of UGC on Instagram.

Keywords - User-Generated Content; Review Content; Brand Attitude; Online Purchase Intention; Instagram; Local Beauty Products.

I. INTRODUCTION

Known for its enormous population, Indonesia is expected to be a prospective market for the beauty industry due to the growing trend of cosmetics and beauty products [1]. Along with economic growth and increasing purchasing power, people are starting to consider beauty products as part of their necessities to improve their welfare [2]. This signifies that the cosmetics or beauty industry in Indonesia has great potential and can also be considered as a promising industry as the market is anticipated to grow annually by 5.34% (CAGR 2022-2026) [3].

Numerous kinds of information can be obtained easily through social media platforms in this digital era. To put it another way, people nowadays have progressed to a world where information is at their fingertips as a result of continuous content creation [4]. According to reference [5], as of January 2021, social media users in Indonesia are dominated by people aged 25-34 years at 34.1%, followed

by people aged 18-34 years at 30.7%, and people aged 35-44 years occupying the third place at 13.1%. Therefore, it can be concluded that current social media users are dominated by people of productive age who fall into the millennial and Gen Z categories.

The rapid development of today's technology gives significant impacts on people's lives. One of the impacts is the rapid growth of social media platforms daily usage. During the COVID-19 pandemic, particularly between 2020 and 2021, the number of social media users in Indonesia increased by 6.3% or was equivalent to 10 million users [6]. This implies that social media has played a crucial role during the pandemic, impacting many aspects of people's lives starting from work, education, entertainment, to shopping [7].

Digitization and the pandemic have transferred beauty products into the online world, where people have access to a wide variety of products, reviews, and shipping options [8]. The beauty industry of Indonesia has also started to produce its own local beauty brands and various products such as Luxcrime, BLP beauty, Dear Me Beauty, Elsheskin, Somethinc, and many more. The growing number of local cosmetic or beauty product brands in the marketplace today makes them more aggressive in terms of promotion [9]. Through this effort, local beauty brands in Indonesia are starting to compete through various social media platforms utilization, such as Instagram and TikTok.

Instagram is one of the primary platforms for User-Generated Content (UGC) as it allows users to create and share posts or reviews regarding various brands [10]. Instagram is one of popular platforms for marketing campaigns because the shared contents there are considered brief, fun, trendy, creative, and engaging [11]. Reference [12] shows that there were approximately 104,175,200 Instagram users in Indonesia as of January 2022, and most of the users were women (54%). Instagram surpasses other platforms in content marketing and brand engagement activities and is regarded as the optimal platform for beauty products marketing [13].

Because of the attachment to social media, consumers' purchasing decisions nowadays are highly influenced by the opinions of other users in the social media [14]. This explains that consumers have tendencies to look up to others' experiences through UGCs over common promotion methods since they are considered as more

trustworthy reviews [15]. Consumers will rely on the content generated by other users as a guidance in making a purchase decision [16]. They have tendencies to believe that other users will give their honest opinion regarding the products, whether they are negative or positive [15]. Reference [17] highlights that user-generated content is a trustworthy source for people, as the ones who generate content are considered as opinion leaders.

With the expanding market and the emergence of new local beauty brands and products in Indonesia, the number of social media users and consumer reviews as in User-Generated Content on online media platforms is also skyrocketing. User-Generated Content has been a developing topic and it also has not been fully explored yet [18]. There are only a few studies that have elucidated the influence of user-generated content (UGC) on the purchase intentions of consumers in different contexts such as brand-related UGC on Facebook, YouTube, and Twitter but the result has not been clearly affirmed yet [19]. In addition, studies with the concern on the impact of brand related UGC towards purchase intention of local beauty products on Instagram are scarce. However, based on the most prior studies, it shows that User-Generated Content in TikTok has a strong enough influence on purchase intention in certain local beauty brands [20]. Another similar study in different contexts such as the restaurant industry shows the role of UGC which has a positive effect on restaurant selection or purchasing intention [18]; [21]; [22]. In fashion brand context studies, the effect of UGC also shows a positive relationship with pre-purchase decision and purchase intention [23]; [24].

II. METHODOLOGY

This study was carried out to investigate (1) the effect of User-Generated Review Content on Instagram on brand attitude, (2) the effect of User-Generated Review Content on Instagram on online purchase intention, (3) the effect of brand attitude on online purchase intention, and (4) the mediating effect of brand attitude in the relationship between User-Generated Review Content on Instagram and online purchase intention. Fig. 1 presents the conceptual framework of this study.

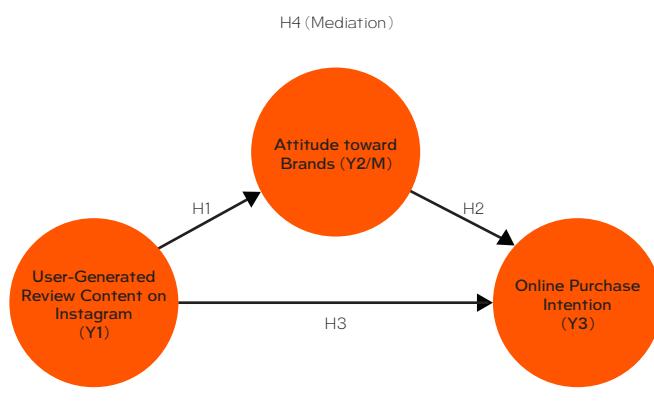


Fig. 1. Conceptual Framework

The method used in this study is a quantitative method, where a survey technique was used to collect primary data. In the process of creating and developing the questionnaire, the researcher referred to several previous studies. The 5-Point Likert Scale questionnaire that had been generated on Google Forms was distributed online. The population studied was 17-25 years old female individuals who were domiciled in Greater Jakarta (Jabodetabek) and Bandung. Reference [43] shows that West Java Province has the most social media and internet access, whereas Greater Jakarta (Jabodetabek) and Bandung cities are considered West Java's metropolitan cities, with more advanced internet connectivity and infrastructure. A non-probability type of sampling which is purposive sampling or judgmental sampling method was used to determine the characteristics of the sample needed.

This study focuses on active Instagram users who have accessed User-Generated Content about local beauty product reviews and local beauty product consumers. With the growing social media users and the emergence of numerous local beauty brands or products in Indonesia, consumer reviews on online social media platforms are also increasing. Instagram is the focus of this study due to insufficient research on the topic of UGC on Instagram platform. Because of the growing and innovative cosmetic market trends in Indonesia, this study focuses on local beauty products.

To estimate the minimum sample size needed for this study, the author refers to the "10-times rule" [25], since this study utilizes the PLS-SEM (Partial Least Squares Structural Equation Modeling) approach. The '10-times rule' postulates the sample size should be greater than or equal to (1) "10 times the largest number of formative indicators used to measure a single construct, or (2) "10 times the largest number of structural paths directed at a particular construct in the structural model." [25]. Since this study only uses reflective indicators, the second rule of thumb is performed. From the author's proposed conceptual framework, the dependent variable that has the most arrowhead pointed at is the 'online purchase intention' variable, which has 2 arrowheads pointed at the construct. This indicates that the minimum sample size needed is 20 (2 multiplied by 10). However, PLS-SEM estimations are more reliable when sample sizes are larger [25]. A sample size of 100 to 200 is considered decent for path modeling [26]. Reference [27] states that the recommended sample size for PLS is from 30 to 100. Therefore, referring to the supporting sources and studies, the minimum sample size of this study is 100.

To analyze the data obtained, Microsoft Excel was utilized to conduct descriptive statistic analysis. PLS-SEM analysis was also conducted using SmartPLS 3.0 software to analyze the validity and reliability as

well as the hypothesis testing. The main advantage of the PLS-SEM method is that it allows researchers to estimate complicated models with multiple constructs, indicator variables, and structural paths without enforcing distributional assumptions on the data [28]. There are 7 (seven) steps of data analysis process using the PLS-SEM method, which are (1) specifying the inner path model; (2) specifying the outer path model; (3) examining the data (validity and reliability testing); (4) model estimation of PLS path; (5) evaluating measurement models; (6) evaluation of the structural model; and (7) advanced PLS-SEM analysis [25].

III. RESULTS

A. Profile of Respondents

The results from 126 samples show that most of the participants are in the age group of 20-22, which is 69.05% of the respondents. This also correlates with the fact that the participants are dominated by college students, which accounts for 84.13%. Most of the participants also live in Greater Jakarta area (Jabodetabek) which accounts for 53.17%, followed by Bandung city (46.83%). From 126 participants, most of the the answer shows that they earned IDR 0-1000,000 a month, which accounts for 61.11%. It can be inferred that most of the respondents are in the low-income category due to most of them being students. Most of the participants spend less than IDR 500,000 a month in beauty product category, which accounts for 81.75%. It can be inferred that most of the respondents' average spending on beauty products are considered low.

Out of 126 participants, 123 people use Instagram, which accounts for 97.62%, followed by Twitter as many as 109 people (86.51%), Youtube as many as 91 people (72.22%), TikTok as many as 82 people (65.08%), and Facebook as many as 15 people (11.90%). It can be concluded that Instagram is the most used social media among the respondents. Most of the participants accessed social media more than 3 hours, which accounts for 49.21% of the respondents. From the data obtained, it shows that in the last 1 month most of the respondents purchased beauty products 1-3 times, which is 79.37% of the respondents. Thus, it can be inferred that the majority of respondents' beauty product purchase in the last month is 1-3 times in a month.

B. Convergent Validity

The convergent validity is examined by assessing the outer loadings and the average variance extracted (AVE) values. Table I and Table II shows the outer loading results and the average variance extracted (AVE) values.

Table 1 - OUTER LOADINGS

Indicator	Outer Loadings		
	BA	OPI	UGRC
BA_1	0.846		
BA_2	0.820		
BA_3	0.837		
BA_4	0.847		
OPI_1		0.807	
OPI_2		0.923	
OPI_3		0.909	
OPI_4		0.910	
UGRC_1			0.803
UGRC_2			0.833
UGRC_3			0.771
UGRC_4			0.818
UGRC_5			0.745
UGRC_6			0.527
UGRC_7			0.656
UGRC_8			0.750

The cut-off value of an indicator's outer loading is 0.70. An indicator with a value below 0.7 is recommended to be eliminated. However, indicators that have outer loadings of 0.40-0.70 should be removed if the removal raises the Composite Reliability or Average Variance Extracted (AVE) above the cut-off value [25]. This implies that if an indicator's outer loading is between 0.40 and 0.70 while the Composite Reliability or AVE value is still above threshold, the indicator should be retained. In Table I, all indicators except for UGRC_6 and UGRC_7 are above 0.70 which indicate that these indicators are acceptable. UGRC_6 and UGRC_7 outer loading values are 0.527 and 0.656 respectively, which indicates that both indicators are below the cut-off value (0.70). However, both indicators are retained because the value of AVE and Composite Reliability (see Table IV) are still above threshold (>0.5).

Table 2 - AVE Results

Construct	AVE
Brand Attitude (BA)	0.702
Online Purchase Intention (OPI)	0.790
User-Generated Review Content (URGC)	0.553

The cut-off value of AVE to be considered acceptable is 0.50. An AVE greater than or equal to 0.50 means that the variance of the items in the construct is explained by the construct by 50 percent or more [28]. In Table II, all the construct's AVE values are above 0.50, which indicates that all the constructs are acceptable in terms of convergent validity. Therefore, it can be concluded that the research instrument or the outer model in this study is supported for convergent validity.

C. Discriminant Validity

Discriminant validity is the degree to which a construct empirically differs from one another [25]; [29]. To assess discriminant validity, the Fornell-Larcker Criterion method is used. The Fornell-Larcker Criterion suggests that the square root of AVE of a construct should be higher than correlations between latent variables. Table III shows the square root of AVE of each construct as well as correlations between constructs.

Table 3 - FORNELL-LARCKER CRITERION RESULTS

Construct	BA	OPI	UGRC
Brand Attitude (BA)	0.838		
Online Purchase Intention (OPI)	0.646	0.889	
User-Generated Review Content (UGRC)	0.44	0.512	0.744

The value that is marked with bold is the square root of AVE of a construct. For example, the square root of AVE of Brand Attitude (BA), Online Purchase Intention (OPI), and User-Generated Review Content are 0.838, 0.889, and 0.744 respectively. The non-bolded values represent the correlation between constructs. From Table III, the square root of AVE of each construct is higher than the correlation between constructs. For instance, the square root of AVE of OPI construct is 0.889, which is higher than the correlation between OPI and BA (0.646). Similarly, the square root of AVE of UGRC (0.744) is higher than the correlation between UGRC & BA (0.440) and UGRC & OPI (0.512). Therefore, it can be concluded that the research instrument or the outer model in this study is supported for discriminant validity.

D. Reliability Testing

Reliability is the degree to which measurements are error-free and ensure the consistency of measurement across time as well as across the various items in the instruments [31]. In other words, it is the degree to which measurements are repeatable when performed by other researchers [32]. To assess the reliability of the instrument, the measurements used are the Composite Reliability and Cronbach's Alpha, which assesses the reliability based on the intercorrelation of the indicator variable [29]. Table IV shows the reliability test result based on Composite Reliability and Cronbach's Alpha values of each construct.

Table 4 - COMPOSITE RELIABILITY AND CRONBACH'S ALPHA RESULTS

Construct	Composite Reliability	Cronbach's Alpha
Brand Attitude (BA)	0.904	0.859
Online Purchase Intention (OPI)	0.937	0.911
User-Generated Review Content (UGRC)	0.907	0.881

The acceptable value of the Composite Reliability and Cronbach's Alpha is 0.7 or higher [25]; [30]. From Table IV, all of the construct's Composite Reliability and Cronbach's Alpha are above the threshold. Therefore, it can be concluded that the research instrument or the outer model in this study is reliable.

E. Coefficient of Determination

The coefficient of determination or R square (R²) measures the degree to which the independent variable explains the dependent variables in terms of the proportion of variance [33]. Reference [34] suggests that R square values of 0.67, 0.33, or 0.19 for dependent latent variables are indicated as substantial, moderate, or weak respectively. Table V shows the R square value of all exogenous (dependent) variables.

Table 5 - R SQUARE RESULTS

Dependent Variable	R Square
Brand Attitude (BA)	0.193
Online Purchase Intention (OPI)	0.482

The R square value of Brand Attitude (BA) and Online Purchase Intention (OPI) are 0.193 and 0.482 respectively. This further explains that User-Generated Review Content (UGRC) as an independent variable is capable of influencing the Brand Attitude (BA) by 19.3%. Therefore, the coefficient of determination of Brand Attitude (BA) is considered weak. In addition, User-Generated Review Content (UGRC) and Brand Attitude (BA) are simultaneously capable of influencing the Online Purchase Intention (OPI) by 48.2%. Therefore, the coefficient of determination of Online Purchase Intention (OPI) is considered moderate.

F. Hypothesis Testing

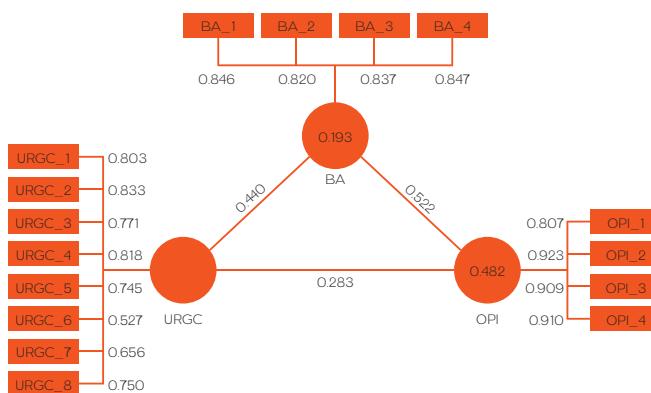


Fig. 2. Structural Model

The hypothesis testing was conducted to test the significance of the relationship between the hypothesized variables. Fig. 2 illustrates the structural model of the study which contains the direct effect values between variables. Using SmartPLS 3.0, hypothesis testing was carried out by running a bootstrapping procedure. Table VI presents the result of path coefficient from the bootstrapping procedure.

Table 6 - PATH COEFFICIENT RESULTS

Hypothesis	Original Sample (O)	T Statistics (O/STDEV)	P Values
Brand Attitude -> Online Purchase Intention	0.522	8.731	0.000
User Generated Review Content -> Brand Attitude	0.440	5.309	0.000
User Generated Review Content -> Online Purchase Intention	0.283	3.447	0.000

The relationship between User-Generated Review Content (UGRC) and Brand Attitude (BA) is represented by User Generated Review Content -> Brand Attitude. Since the Original Sample of the relationship between UGRC and BA is equal to 0.440, thus, the relationship is considered positive. The p-value is equal to 0.000, which is less than 0.05 and the t-value is 5.309 which is greater than 1.65. The result shows that user-generated review content on Instagram has a positive and significant relationship with brand attitude. Therefore, it can be concluded that Hypothesis 1 is supported.

The relationship between Brand Attitude and Online Purchase Intention is represented by Brand Attitude -> Online Purchase Intention. Since the Original Sample of the relationship between BA and OPI is equal to 0.522, thus, the relationship is considered positive. The p-value is equal to 0.000, which is less than 0.05 and the t-value is equal to 8.731 which is greater than 1.65. The result shows that brand attitude has a positive and significant

relationship with online purchase intention. Therefore, it can be concluded that Hypothesis 2 is supported.

The relationship between User-Generated Review Content and Online Purchase Intention is represented by User Generated Review Content -> Online Purchase Intention. Since the Original Sample of the relationship between BA and OPI is equal to 0.283, thus, the relationship is considered positive. The p-value is equal to 0.000, which is less than 0.05 and the t-value is equal to 3.447 which is greater than 1.65. The result shows that user-generated review content has a positive and significant relationship with online purchase intention. Therefore, it can be concluded that Hypothesis 3 is supported.

G. Mediation Analysis

Reference [25] suggests that to examine the mediating effect, the significance of the direct effect between UGRC and OPI without including the mediator variable (BA) needs to be examined first. If the direct effect is significant, the next step is examining the indirect effect significance. If the indirect effect is significant, the last step is to assess the Variance Accounted For (VAF). VAF greater than 80% means full mediation, between 20% and 80% means partial mediation, and less than 20% means no mediation. Table VII shows the path coefficient result of the relationship between UGRC and OPI without a mediating variable BA.

Table 7 - DIRECT EFFECT RESULTS (UGRC AND OPI)

	Original Sample (O)	T Statistics (O/STDEV)	P Values
Brand Attitude -> Online Purchase Intention	0.518	6.413	0.000

The result shows that the Original Sample of the relationship between UGRC and OPI is equal to 0.518, thus, the relationship is considered positive. The p-value is equal to 0.000, which is less than 0.05 and the t-value is equal to 6.413 which is greater than 1.65. The result shows that without a mediating variable, user-generated review content has a positive and significant relationship with online purchase intention.

Table 8 - INDIRECT EFFECT RESULTS

	Original Sample (O)	T Statistics (O/STDEV)	P Values
UGRC -> BA -> OPI	0.229	4.845	0.000

Table VIII shows the bootstrapping result of specific indirect effect. The result shows that the Original Sample of the relationship between UGRC and OPI mediated by BA is equal to 0.229, thus, the relationship is considered positive. The p-value is equal to 0.000, which is less than 0.05 and the t-value is equal to 4.845 which is greater than 1.65. The result shows that the indirect effect is significant.

The next step is determining the value of Variance Accounted For (VAF). To calculate the VAF, the formula is:

where P1 P2 is the indirect effect and P3 is the direct effect.

Therefore, the calculation is as follows:

$$VAF = \frac{P1 + P2}{P3} = 0.3065 \sim (31\%)$$

From the calculation, the VAF value is 31% which indicates that there is a partial mediation effect and thus, it can be concluded that Hypothesis 4 is supported.

IV. DISCUSSION

From the analysis of the results, User-Generated Review Content (UGRC) has a positive and significant effect on Brand Attitude (BA). This further implies that the more positive one's perception of User-Generated Review Content on Instagram, the more positive also one's attitude toward a brand. In this study, User-Generated Review Content can be used interchangeably with eWOM because the context is brand-related UGC (beauty products/brands). An individual's attitude toward brands is pertinent to his or her exposure to any kind of information related to the brand.

User-Generated Review content on Instagram is one of many kinds of information that can influence an individual's attitude toward brands. Some prior studies regarding user-generated content or electronic word of mouth effect on brand attitude have shown the positive and significant results between two constructs. Reference [35] shows that positive user-generated social electronic word of mouth on Facebook has a positive influence on attitude toward smartphone brands. Reference [36] also shows that there is a significant impact of UGC on attitude towards brands. Positive electronic word of mouth greatly helps in the promotion of positive attitudes toward products [37].

Brand Attitude (BA) has a positive and significant effect on Online Purchase Intention (OPI). This further implies that the more positive one's attitude toward a brand, the more positive one's propensity to purchase the product through online stores/e-commerce. The behavioral

intention, (in this context, online purchase intention) is the result of one's attitude toward the attitude object (in this context, brands). In other words, an individual's intention to purchase beauty products is the consequence of his or her attitude toward a certain beauty products' brand. Some prior studies have shown that consumers who have a positive attitude toward a brand tend to have a higher propensity to purchase the product. For instance, when the attitude toward a brand is favorable, younger people have higher purchase intentions for products/services [38]. Reference [39] also reveals that brand attitude based on social media brand community can cause users to form purchase intentions.

User-Generated Review Content (UGRC) has a positive and significant effect on Online Purchase Intention (OPI). This further implies that the more positive one's perception toward User-Generated Review Content, the more positive also one's propensity to purchase the product through online stores/e-commerce. User-Generated Review Content about beauty products/brands could be a reliable source of information for consumers in reducing uncertainty related to how the product will perform. User-Generated Review Content also could be a stimulus to foresee consumers' intention in purchasing a certain beauty product through online stores/e-commerce. Some prior similar studies related to beauty products have shown UGC has a positive impact on purchase intention of beauty products [1]; [20].

Brand Attitude (BA) has a partial mediation effect in the relationship between User-Generated Review Content (UGRC) and Online Purchase Intention (OPI). This further implies that the mediating variable of Brand Attitude (BA) mediates some but not all the relationships between User-Generated Review Content (UGRC) variable and Online Purchase Intention variable. Online shopping is on the rise in this age of technology. Online shopping does, however, frequently include some risk or uncertainty. User-generated review content, or eWOM, in this context, can assist consumers in buying decisions, form their attitudes about companies and items, and may even affect their inclination to make online purchases [15]; [16]. This suggests that brand attitude serves as a linkage between online purchase intention and user-generated review content or eWOM.

Prior studies have shown that brand attitude has a partial mediation effect on UGC or eWOM and purchase intention [35]; [40]. However, since the result shows that the mediation effect is only partial, there might be some other factors or variables that are capable of fully mediating the relationship of UGC or eWOM and purchase intention. For instance, some prior studies have shown that Brand Image variable is capable of fully mediating the relationship between eWOM and purchase intention [41]; [42].

V. CONCLUSION

The findings show that user-generated content, or eWOM, in the form of Instagram review content, has a significant impact on brand attitude and online purchase intention. Furthermore, this study adds to the body of knowledge about User-Generated Content, Instagram, and Online Purchase Intentions. The managerial implication of this study is the contribution to the knowledge regarding User-Generated Review Content on Instagram, Brand Attitude, and Online Purchase Intention to marketers at companies in the beauty sector who create social media marketing plans, particularly on Instagram.

Since the start of the Covid-19 pandemic, there has been a shift in consumer behavior that has changed consumer shopping preferences from those who usually go to offline stores to online shopping. The level of online shopping in Indonesia is increasing due to the presence of various types of e-commerce. Not only changes in consumer behavior related to shopping preferences, but also the duration of internet users that exceeds 3 hours a day can be a reference for marketers to take advantage of technology from social media applications to plan marketing strategies. Marketers must be able to predict consumer online purchase intentions based on user-generated content and other factors influencing consumer purchase intention, and then develop sales strategies accordingly. This study further suggests that local beauty product marketers should consider user-generated review content as part of their marketing strategy.

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Paper 6

The Influence of Woman Apparel Brand New Brand Image
In Generating Brand Trust, Brand Prestige, Brand Love,
and Brand Loyalty

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ICMEM

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Abstract - In 2018, A Woman Apparel Brand (Brand X) is facing problems because of its brand image. They got a negative stigma and boycott from the public, it leads to the cancellation of the Brand X Fashion Show in 2019. Furthermore, in 2020, the show was also canceled due to the pandemic. Therefore, Brand X Brand decided to rebrand brand image as a response to its issue in 2018 with the Body Positivity concept. They got various responses about their new brand image both positive and negative sides. Thus, this research aims to identify the influence of Brand X Rebranding on Brand Loyalty by assessing it's Brand Trust, Prestige, and Love. This research was conducted using a quantitative approach through an online survey with 263 Respondents who meet the criteria and use descriptive statistics with PLS-SEM to analyze the data. The result are showed that A Woman Apparel Brand Rebranding Brand Image has a positive influence on Brand Trust, Brand Prestige, and Brand Love; Brand Trust on Brand X Rebranding Brand Image does not have a positive influence on Brand Loyalty, and Brand Prestige and Brand Love on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty.

Keywords - Rebranding, Brand Image, Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty

I. INTRODUCTION

BACKGROUND

Brand X or is a prominent American retail company founded by Roy Raymond in 1977. The Brand X sells products for women, such as underwear or lingerie as its main product, in addition to perfume or fragrance mists and women's bags [1]. Brand X has always used body and beauty concepts as part of its branding, where white skin and slim body shapes are typically highlighted [1]. The Perfect Body Campaign in 2014 was part of the Brand X's branding [2]. The campaign included Brand X Angels as components of their brand image and the Brand X Fashion Show as its annual event [3].

Based on a preliminary survey conducted from August to September 2021 distributed to gain knowledge about the public's perspective on Brand X branding regarding both Brand X Angels and the Brand X Fashion Show, the respondents believed that Brand X has a significant enough influence in setting global beauty standards, especially among Indonesian women. Although initially,

Brand X used Brand X Angels and the Brand X Fashion Show as their marketing tool, with extensive additions, the Brand X has changed the world's perspective by creating a beauty standard where Brand X Angels reign supreme. These "Angels" had white skin, long legs, and many more [32].

However, the general public's response to the standards created by Brand X Angels has been negative. In 2018, there was a petition to boycott the Brand X Fashion Show as a form of protest against the beauty standard created by the Brand X [4]. The boycott petition resulted in a decrease in market share from 31.7% in 2013 to 24% in 2018 [5]. Then, in 2019, the Brand X Fashion Show event was canceled due to various factors, one of which was the negative stigma brought by public criticism who considered the Brand X event to be sexist, archaic, and lacking diversity in the notion of feminine beauty. In addition, during 2019, the Brand X's decline in net sales was also one of the reasons for the cancellation of the event that year, as the Brand X's sales dropped by \$252m or 195.1m in the third quarter of 2019 [6].

In the following years, from 2020 to 2021, an economic recession occurred during the COVID-19 pandemic. This resulted in a decline in consumer purchasing power due to changes in consumer behavior. The pandemic affected the economy and purchasing power of consumers, as a majority preferred to save rather than spend. A study has shown that Personal Consumption Expenditure (PCE) in the clothing sector went from 3.8% in 2019 to -7.7% in 2020 [7]. This indicates that people preferred to buy other commodities besides clothes during 2020. Moreover, the global economy also faced significant obstacles, as shown by the decrease of GDP Growth by -4.36% globally [7]. These troubling times undoubtedly affected Brand X products as the Brand X experienced a drastic decline in sales in 2020. According to data from [8] in 2020, Brand X sales decreased from \$7,509m in 2019 to \$5,413m.

In 2021, Victoria's Experimental Secret made a comeback by altering its brand image, which featured the phrase 'Brand X Collective.' In this rebrand, Brand X welcomed multiple models with the theme of diversity, as models with varied body types and ethnicities were included in this campaign. This was done in response to the negative backlash they received from the public since 2019. Additionally, in this rebrand, the Brand X highlighted the idea that a woman's beauty is not only physical but that

it can also be shown through their accomplishments and personality. This is evidenced by the participation of several models, including Megan Rapinoe, a 35-year-old soccer star and gender equity campaigner; Eileen Gu, a 17-year-old American freestyle skier; Paloma Elsesser, a 29-year-old size 14 woman who graced the cover of Vogue magazine; and Priyanka Chopra Jonas, a 38-year-old Indian actress, and technology investor [9]. Through this rebranding strategy, Brand X hoped to show that they support women's empowerment and state that their previous brand image does not encapsulate real beauty [10].

The emergence of the Brand X rebrand has received various positive responses from many celebrities [11]. One of them was Tyra Banks, an American model who is also a judge at American Next Top Model. She supported this rebrand by uploading a photo on her Instagram and expressing her thoughts through the caption. However, there was also a negative response regarding the Brand X's choice to update its brand image. Michelle Halim, an influencer from Indonesia and a freelance model, gave her opinion through her Instagram Story regarding her disappointment with Brand X [12].

Nevertheless, Brand X's rebranding strategy can be said to be quite risky because according to research conducted by [13] rebranding strategies must be thought out carefully as it can be likened to updating something that has already been introduced to the public. In this case, Brand X new brand image as a part of its rebranding strategy was not tested for its influences in generating public brand trust, brand prestige, brand love, and brand loyalty beforehand.

According to past research by [14], brand image has a significant influence both on brand trust and brand loyalty. [15] and [14] likewise confirmed the impact of brand image on consumer brand trust. Additionally, [16] and [14] stated that the primary cause of consumers' high level of trust is brand image. Furthermore, Ming et al., (2011) and [14] found a positive relationship between brand image and brand trust. Furthermore, previous research by [17] found that brand trust, brand prestige, and brand love all have a positive association and can mitigate the influences of brand loyalty. As a result, this research objective is to assess the influence of Brand X Rebranding Brand Image by assessing its Brand Trust, Brand Prestige, and Brand Love and to assess the influence of Brand Trust, Brand Prestige, and Brand Love of Brand X Rebranding toward Brand Loyalty.

RESEARCH VARIABLE DEVELOPMENT

Brand Image and Brand Trust

Based on the [14] studies, brand image has a significant influence on both brand trust and brand loyalty, as the primary cause is consumers' high level of trust is brand image, and there is a positive relationship between brand image and brand trust. Furthermore, [18] state that brand image is the most influential factor in the brand-building process, followed by the influence of brand experience on brand attachment. These findings suggest that in the early stages of brand development, brands should first maintain their image in order to gain the trust of their consumers. As a result, the following hypothesis is proposed in this study

H1: Brand X's Rebranding Brand Image has a positive influence on brand trust

Brand Image and Brand Prestige

[19] stated that when consumers have a positive impression of a Brand X's brand image, brand prestige and consumer behavior intention are more likely to increase. To reach the level of positive brand image, however, the brand would need to make additional efforts to create a positive image in the eyes of consumers in order to increase brand prestige and behavior intention. The study also demonstrated that adherence to laws and ethics positively impacts brand image. Compliance will assist a brand in gaining the support of all stakeholders, thereby enhancing its brand image. Consequently, the purpose of this study is to determine if the new Brand X brand image can significantly influence the brand's prestige. The proposed hypothesis is as follows:

H2: Brand X's Rebranding Brand Image has a positive influence on brand prestige

Brand Image and Brand Love

Consumers are more likely to increase word-of-mouth communication for a brand that they love, according to research conducted by [20]. These researchers found that brand love is significantly affected by brand image. They also stated that brands would make an effort to cultivate "brand love," which is defined as an emotional connection that goes beyond satisfaction and exists between a brand and its group of devoted customers. Customers could be loyal to a brand out of love for the company, in which case they would behave as though they were in a romantic relationship, prioritize the brands they are loyal to over competing options, and talk positively about the company through word-of-mouth communication. For

instance, if the customer perceives a positive image of the brand and the customer perceives that the brand reflects their social self, then a relationship, similar to a love affair, may develop between the customer and the brand.

As a result, the purpose of this study is to investigate whether or not the new Brand X brand image has the potential to significantly affect brand love. The following is the hypothesis that has been proposed:

H3: Brand X's Rebranding Brand Image has a positive influence on brand love.

Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty

According to [17], there was a significant correlation between brand love, prestige, and trust, and brand loyalty. Then, according to findings, the relationship between brand prestige and brand loyalty is stable, resulting in consumers' eventual willingness to pay a higher price for particular products. In other instances, the research suggests that females who tend to purchase expensive and well-known cosmetics are already brand loyal. Consumers develop loyalty as a result of the trust that has already been established. When a consumer already trusts a brand, their loyalty to that brand will increase. Another reason to increase brand loyalty is brand adoration. Moreover, according to a paper by [21], trust is the gateway to customer loyalty. These statements demonstrate that loyalty can be predicted by trust.

Another reason to increase brand loyalty is brand adoration. Customers who are loyal to the brand they adore would act as if they are in love by favoring the brand over alternatives and speaking positively about it. According to a previous study from [20], when customers feel affection for a brand, brand loyalty is created in both the customer and those around them. Thus, the purpose of this study is to determine if brand love, brand prestige, and brand trust significantly impact brand loyalty. These are the proposed hypotheses:

H4: Brand trust in Brand X's Rebranding Brand Image has a positive influence on brand loyalty.

H5: Brand prestige in Brand X's Rebranding Brand Image has a positive influence on brand loyalty.

H6: Brand love for Brand X's Rebranding Brand Image has a positive influence on brand loyalty.

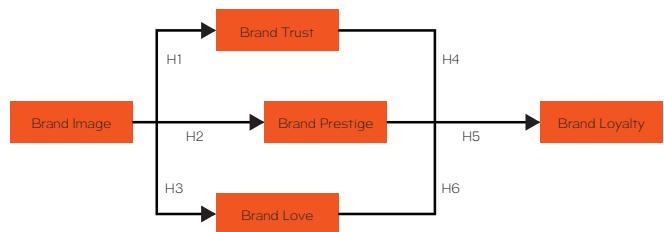


Fig. 1. Conceptual Framework

Hence, there is a conceptual model proposed in this study to examine the Influence of Brand X's New Brand Image in generating brand trust, brand prestige, brand love, and brand loyalty (Figure 1).

II. METHODOLOGY

In this quantitative study, The Influence of Rebranding Brand Image of a Woman Brand on Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty that were validated as the defined variables. The distribution of questionnaires over the internet was done in order to collect the data. Since the pandemic created conditions that were partially quarantined, a web-based approach was chosen because it was the most practical and efficient method for locating respondents who were suitable for the study.

A multiple-choice and open-ended questionnaire will be used to collect socio-demographic and behavioral information. On the other hand, a Likert-scale question from a study by [22] will be used to assess Brand Image, Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty. The Likert-scale questions required respondents to select a level of agreement on a scale of one to five, with one indicating a strongly disagree answer and five indicating a strongly agree answer.

The respondents in this study were customers of Brand X products from Indonesia who know about Brand X's new brand image. The selection criteria were met by a total of 263 respondents with the details of respondent profiles are between 17 – 24 years old, Female, and University students. As the behavior, respondents mostly ever bought Brand X Product less than 3 times in a year, with Perfume as most bought products by respondents. The study used the judgmental or purposive sampling technique as samples that fulfilled the requirements were selected. These requirements consist of customers or consumers of Brand X until 2021.

The data and information in this study were gathered entirely from questionnaires distributed via Google Form. The data collected from the respondents were then analyzed by using descriptive statistics and hypothesis testing.

III. RESULTS

Descriptive Analysis

Five indicators from studies conducted by [23], [24], [20], and [25], were used to evaluate the variable brand image. Afterward, Brand trust was evaluated using five indicators from the research of [17] and [26]. The prestige of a brand was evaluated using four indicators from [20] study. In addition, Brand love was evaluated using six indicators from the studies of [27] and [20]. Last, seven indicators were used to evaluate brand loyalty in accordance with [20], [28], and [25] studies. Each item was evaluated using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Table 1 - Research Measurement

No.	Variable	Indicator	Label	Mean	Sources
1	Brand Image	Brand X's New Brand Image is very well known to the public.	BI1	3.563	[20], [23], [24], [26]
		Brand X New Brand Image has high quality.	BI2	4.251	[26]
		Brand X New Brand Image has brand characteristics.	BI3	4.350	
		Brand X's New Brand Image has a positive impression.	BI4	4.536	
		Brand X's New Brand Image is strong.	BI5	4.376	
2	Brand Trust	Brand X's New Brand Image meets my expectations.	BT1	3.935	[17], [26],
		Brand X's New Brand Image can be trusted.	BT2	3.916	
		Brand X's New Brand Image is reliable.	BT3	3.882	
		I trust Brand X with their New Brand Image	BT4	4.004	
		I feel confident about Brand X's New Brand Image	BT5	4.065	
3	Brand Prestige	Brand X has a Prestigious New Brand Image.	BP1	4.118	[19]
		Brand X's New Brand Image is known as an elite class.	BP2	4.072	
		Brand X's New Brand Image has a good reputation.	BP3	4.141	
		Using Brand X Brand with Their New Brand Image makes me feel elite.	BP4	3.753	
4	Brand Love	Brand X's New Brand Image makes me feel good and happy.	BL1	4.084	[27], [20]
		I am interested in Brand X's New Brand Image.	BL2	4.175	
		Brand X has a wonderful New Brand Image	BL3	4.118	
		I am very attached to Brand X's New Brand Image.	BL4	3.510	
		Brand X's New Brand Image is a pure delight.	BL5	3.612	
		I love Brand X's New Brand Image.	BL6	3.958	

5	Brand Loyalty	I intend to use Brand X Brand after their Rebranding with the New Brand Image.	BY1	3.677	[20], [28], [26]
		I used Brand X Brand after their Rebranding to their New Brand Image as it is my choice.	BY2	3.532	
		I consider myself to be loyal to Brand X after their Rebranding to their New Brand Image.	BY4	3.418	
		I would recommend Brand X Brand to my relatives after their Rebranding to their New Brand Image.	BY5	3.635	
		I am more interested in Brand X Brand than other brands after their Rebranding to their New Brand Image.	BY6	3.278	

The sample's important data characteristics were identified using descriptive statistics analysis. According to the findings of this study, the brand image variable with the indicator "Brand X New Brand Image has a positive impression" has the highest mean score of 4.543. This statement suggests that the new Brand X brand image left a positive impression on the respondents. Meanwhile, the brand loyalty variable with " I am more interested in Brand X Brand than other brands after their Rebranding to their New Brand Image" has the lowest mean score at 3.278. This statement indicates that the audience does not pay more attention to the Brand X Brand after its rebrand.

Hypothesis Testing

In this section, the Partial Least Squares(PLS)computation was used to explain the results of hypothesis testing as well as the significance demonstrated by the T-values evaluated by the inner model path coefficient. Table 2 displays the results of the hypothesis testing.

Table 2 - Hypothesis Testing

Hypothesis	Structural Path	T Values	P Values	Result
H1	Brand Image -> Brand trust	14.480	000.0	Accepted
H2	Brand Image -> Brand prestige	12.633	000.0	Accepted
H3	Brand Image -> Brand love	13.755	000.0	Accepted
H4	Brand trust -> Brand loyalty	15.30	0.127	Rejected
H5	Brand prestige -> Brand loyalty	2.769	000.0	Accepted
H6	Brand love -> Brand loyalty	6.253	000.0	Accepted

According to Hypothesis 1 of this study, Brand X's New Brand Image has a positive influence on brand trust. The hypothesis is accepted because its T-value is 14.480, which is greater than 1.96 and has a P-value of 0.05 (5%). As a result, it is possible to conclude that Brand X's New Brand Image has a positive impact on brand trust.

Then, the second hypothesis stated, Brand X's New Brand Image has a positive impact on brand prestige.

This hypothesis has a T-value of 12.633, which is greater than 1.96 and has a P-value of 0.05 (5%). As a result, this hypothesis is accepted, and it is possible to conclude that Brand X's New Brand Image has a positive impact on brand prestige. According to Hypothesis 3, Brand X's New Brand Image has a positive influence on brand love. The hypothesis is accepted because its T-value is 13.755, which is greater than 1.96 and has a P-value of 0.05 (5%). As a result, this finding suggests that Brand X's New Brand Image has a positive impact on brand love.

Following that, hypothesis 4 asserted that brand trust in Brand X's New Brand Image has a positive influence on brand loyalty. The hypothesis is rejected because its T-value is 1.530, which is less than 1.96 and has a P-value of 0.05 (5%). As a result, it is possible to conclude that brand trust in Brand X's New Brand Image has no positive influence on brand loyalty. Hypothesis 5 stated that brand prestige has a positive influence on brand loyalty in Brand X's New Brand Image. This hypothesis has a T-value of 2.769, which is greater than 1.96, and a P-value of 0.05 (5%) indicating that it is accepted. As a result, brand prestige on Brand X's New Brand Image has a positive influence on brand loyalty. Finally, hypothesis 6 asserted that brand affection for Brand X's New Brand Image has a positive influence on brand loyalty. The hypothesis is accepted because its T-value is 6.253, which is greater than 1.96 and has a P-value of 0.05 (5%). This suggests that Brand X's New Brand Image's brand prestige has a positive influence on brand loyalty.

IV. DISCUSSION

Brand X Rebranding Brand Image has a positive influence on Brand Trust

The first hypothesis assumed that Brand X Rebranding Brand Image has a positive influence on Brand Trust. After analyzing the data in this study, it is found that the hypothesis of Brand X Rebranding Brand Image has a positive influence on Brand Trust is accepted since the T-value is greater than 1.96 at a significant point of 0.05 (5%). This result is consistent with the previous research that has been done by [18] and [14], who found that Brand Image has a positive impact on brand trust. Furthermore, according to the questionnaire result, the mean score of Brand Trust indicators of "I Trust Brand X with their New Brand Image" and "I feel confident about the Brand X New Brand Image" was above 4. Meanwhile, other indicators mean score below four but close to 4, which are 3.935 for "Brand X New Brand Image meets my expectations"; 3.935 for "Brand X New Brand Image can be trusted"; 3.916 "Brand X New Brand Image reliable"; and 3.882 for "I trust Brand X with their New Brand Image." All scores indicate that the respondents highly trust Brand X after

their Rebranding Brand Image. Then, the mean score of Brand Image according to the questionnaire result was also above four and only one indicator was below four which is Brand X New Brand Image is very well known to the public". Thus, based on the questionnaire conducted, the Brand X Rebranding New Brand Image positively influences Brand Trust.

Besides that, based on the questionnaire, the respondents feel that the new Brand X Brand Image, gives a positive impression and good quality to the customers so which gives additional trust to the respondents. It also proved before that variable BT5, which stated "I feel confident with Brand X New Brand Image" have an average score above 4. Not only that, with good and positive Brand Image from the respondents can remove the uncertainty in their minds about the brand due to positive impact of the brand image. It also stated through the BI4, "Brand X New Brand Image give positive perception" that can lead into the respondent's mind of Brand X Brand. Therefore, it can be used for the reasoning that supports the statement stated "The New Brand Image Rebranding to Brand X influence Brand Trust to the respondents or Brand X Customer. And also surprisingly, based on the research. The results also supported by the research from [29]. The research stated that after seeing an advertisement about body positivity, women are more likely to feel comfortable to shop in their store and believe that their lingerie would suit their body type.

Brand X Rebranding Brand Image has a positive influence on Brand Prestige

The second hypothesis assumed that Brand X Rebranding Brand Image has a positive influence on Brand Prestige. After analyzing the data in this study, it is found that the hypothesis of Brand X Rebranding Brand Image has a positive influence on Brand Prestige is accepted since the T-value is greater than 1.96 at a significant point of 0.05 (5%). This result is consistent with the previous research that has been done by [19], who found that Brand Image has a positive impact on brand prestige. Furthermore, according to the questionnaire result, mostly the mean score of Brand Prestige indicators was above 4. However, only one indicator has a mean score below four but still above 3.5, which is "Using Brand X Brand with their New Brand Image makes me feel elite." with a 3.753 score. All scores indicate that the respondents feel prestige on Brand X Brand after their Rebranding Brand Image. Then, the mean score of Brand Image according to the questionnaire result was also above four. Only one indicator was below four which is Brand X New Brand Image is very well known to the public". Thus, the Brand X Rebranding New Brand Image positively influences Brand Prestige based on the questionnaire conducted.

The statement that Brand X Rebranding Brand Image has a positive influence on Brand Prestige is supported by respondents' responses to an open question on the questionnaire about their viewpoint of Brand X's New Brand Image. The majority of respondents assume that Brand X's New Brand Image expresses an exclusive, luxurious, classic, classy, and even elegant impression, that also adds prestige value to Brand X brand. As a result of the responses, Brand X's New Brand Image can be defined as a Brand Image with prestige value due to the luxurious image that leads to the prestigious. The results also supported by research from [30]. The research stated that after create an advertisement about body positivity and inclusivity, they found out the brand looks more inspiring and authentic than before. It means that when someone seeing a brand who use an advertisement about body positivity and inclusivity, they will feel the brand more authentic and inspiring that make the brand rank higher in peoples' mind, and eventually it will become more prestigious.

Brand X Rebranding Brand Image has a positive influence on Brand Love

The third hypothesis assumed that Brand X Rebranding Brand Image has a positive influence on Brand Love. After analyzing the data in this study, it is found that the hypothesis of Brand X Rebranding Brand Image has a positive influence on Brand Love is accepted since the T-value is greater than 1.96 at a significant point of 0.05 (5%). This result is consistent with the previous research that has been done by [20], who found that Brand Image has a positive impact on brand love. Furthermore, according to the questionnaire result, there are six indicators, with three indicators having a mean score above 4 and 3 indicators having a mean score below four but still above 3.5. All scores indicate that the respondent feels loved on Brand X Brand after their rebranding Brand Image. Thus, the Brand X Rebranding New Brand Image positively influences Brand Love based on the questionnaire.

Furthermore, most respondents are more likely to encourage Brand X's New Brand Image. Based on the open question in the questionnaire survey, the New Brand Image gives the impression of an inspiring and good brand image. As a result, the respondent or their customers are more likely to develop a positive emotional relationship with Brand X brand. Then, because of the positive impression of the Brand Image, respondents or customers tend to love Brand X brand. This result is also supported by the research from Northwestern University that stated that majority of women that see body positivity advertisements are extremely positive with the advertising and more likely to support the brands afterwards [29].

Brand Trust on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty.

The fourth hypothesis assumed that Brand Trust on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty. After analyzing the data in this study using a questionnaire, it is found that the hypothesis of Brand Trust on Brand X Rebranding Brand Image does not have a positive influence on Brand Loyalty is rejected since the T-value is lower than 1.96 at a significant point of 0.05 (5%). This result is not aligned with the previous research that was conducted by [17] and [14] because that research stated that Brand Image has a positive influence on Brand Loyalty. Based on the questionnaire conducted, it can be concluded that even though respondents already have trust in Brand X after rebranding its brand image, it does not mean that they will be loyal to the Brand X brand. It also represents through one of indicators Brand Loyalty which is "I pay more attention to Brand X Brand than other brands after their Rebranding with New Brand Image." got the lowest mean score. Therefore, the Brand Trust on Brand X Rebranding Brand Image does not have a positive influence on Brand Loyalty.

Respondents feel that Brand X new Brand Image is deserve to be trusted, but did not guarantee that it will influence their loyalty. It happens because the majority of the respondents is on the age range of 17-24 years old, whereas those who on that age range can be considered as people who constantly change their preferences and try on new things, including new brand for something that they like. Even though it does not mean that Brand X is ignoring the trust aspect, but with how trusted Brand X Brand Image by the customers, it already shows that Brand X consistently gives the best to their customers.

Besides that, there is a possibility that Brand X kind of loyalty are influence this hypothesis. Because essentially, when someone trusts a brand but they do not get something that make them more interested in the brand, it will not increase their loyalty. And also, based on the questionnaire, they only stated that they trust the brand, but does not mean that they are interested to buy the product several times.

Brand Prestige on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty.

The fifth hypothesis assumed that Brand Prestige on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty. After analyzing the data in this study, it is found that the hypothesis of Brand Prestige on Brand X

Rebranding Brand Image has a positive influence on Brand Loyalty is accepted since the T-value is greater than 1.96 at a significant point of 0.05 (5%). This result is consistent with the previous research that has been done by [17], who found that Brand Prestige has a positive association on brand loyalty. It is also represented by the behavioral questionnaire with questions about opinion regarding the New Brand Image, respondents feel that New Brand Image of Brand X have their inclusivity and elegant for a brand.

Then, if we correlate it with the respondent opinion on several questions in the Brand Prestige variable almost all of the questions have scores above 4. Respondents feel like Brand's Prestige makes them feel luxurious or elite so that they have the intention to stay loyal to Brand X because they feel when they use Brand X, they will be considered elite. Besides that, according to [31], prestige perception has a direct influence on buying intention so it also supports the customers' loyalty to Brand X because of the prestige feel. Then, knowing there are people who have a high ego, also creates an impression that if someone has a more prestige product, then he/she looks more luxurious, which pushes them to be more loyal to the brand.

Brand Love on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty.

Last, the sixth hypothesis assumed that Brand Love on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty. After analyzing the data in this study, it is found that the hypothesis of Brand Love on Brand X Rebranding Brand Image has a positive influence on Brand Loyalty is accepted since the T-value is greater than 1.96 at a significant point of 0.05 (5%). This result is consistent with the previous research that has been done by [17] and [20], who found that Brand Love has a positive influence on brand loyalty. Based on the behavioral question about the opinion of the Brand X Rebranding Brand Image, there was a statement from respondents that they feel loved because Brand X seems to put them in their branding, and it makes the respondents feel more loyal to the Brand X brand.

If it correlated to variable BY7 that stated "I am more interested in the Brand X brand than any other brand after they did their Rebranding Brand Image." It can show that when respondent interested with Brand X after New Brand Image, they will be more loyal than before or start to feel loyal if they do not loyal before. It can be said that if customers already feel in love or really like on a brand, they will feel more attached to it (BL4: I feel attached to the New Brand Image of Brand X) and make them only focus on the brand they attached to. This also supported the statement that stated Brand Love on Brand X Rebranding

Brand Image is positively influenced Brand Loyalty

V. CONCLUSION

Conclusion

The findings of this study investigated how Brand X's new brand image influences brand trust, brand prestige, and brand love for the Brand X brand, as well as whether these elements influence consumers' brand loyalty. The following are the study's findings:

1. Brand X's New Brand Image positively influences brand trust, brand prestige, and brand love through several indicators. According to the PLS analysis, Brand X's new brand image has influenced customers' brand trust, brand prestige, and brand love for the Brand X brand. These findings are also consistent with the outcome of the behavioral profile questions. This suggests that Brand X customers have more trust, prestige, and love for the brand after their rebranding to the VS Collective. Some of them also stated that Brand X's new brand image is more interesting, unique, elegant, and makes the customer feel seen and included. These reasons explain how Brand X's New Brand Image influenced brand trust, brand prestige, and brand love.
2. Several indicators in this study also showed that there are positive influences on brand prestige and brand love towards brand loyalty after Brand X's rebranding. This means that the level of customer loyalty to the Brand X brand, or brand loyalty, can be influenced by the increase in brand prestige and brand love following the rebranding of Brand X. Therefore, customers are more likely to be loyal to a brand that has earned both brand prestige and brand love. However, this study found that brand trust does not have a positive influence on brand loyalty after the rebrand. This suggests that if a customer has brand trust in Brand X after they have rebranded, the customer may not necessarily be loyal to the brand. On the other hand, if the customer feels a sense of prestige and love for the Brand X brand after its rebranding, there is a good chance that the customer will remain loyal to the brand.

Theoretical Implication

Several previous studies have looked at the connection of Brand Image and Brand Trust, Brand Image and Brand Prestige, Brand Image and Brand Love, Brand Trust to Brand Loyalty, Brand Prestige to Brand Loyalty, and Brand Love to Brand Loyalty. However, no one has researched case studies on brands similar to the beauty and woman apparel industries. Furthermore, this study focused on the role of New Brand Image in generating Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty. As a result, this

study contributes to filling a gap in the studies of the beauty and women's apparel brand industry, focusing on Brand Image and Rebranding toward Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty. The findings could then be used to expand knowledge of branding and marketing.

Practical Implication

This study's findings highlight the influence of Rebranding in Brand Image in generating Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty from customers. From a practical standpoint, it is an insight because it may help the beauty and women's apparel brand industries gain in-depth practical knowledge of Rebranding in Brand Image, as well as assisting them by providing insights such as factors that have a significant influence and how Rebranding in Brand Image influences gaining Brand Trust, Brand Prestige, Brand Love, and Brand Loyalty from customers in the future. Furthermore, these findings could be used to understand their target market better, allowing them to maximize their branding.

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Paper 7

Strategic Energy Portfolio Optimization for National Oil Company amidst Uncertainties and Climate Change

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Abstract – Facing oil price volatility, loss profitability during COVID-19 pandemic in the year 2020 technological advancement and the declined cost of renewable energy, countries increasing commitment towards net-zero emission target, ESG investment trend, and oil reserves structural declined projection, Indonesia National Oil Company will require strategy to optimize its energy portfolio to enhance resiliency, agility and flexibility to unlock new value and bigger impact for the stakeholders. Optimizing the company's already-diversified energy portfolio as an adaptive strategy will enhance the company resiliency in facing the uncertainty of oil price volatility, technological advancement in new and renewable energy that can increase disruption risk to the company's current strategy as well as to reduce GHG emission, where the scenario simulation shows that gradually optimizing 10-25% new and renewable energy portfolio will enhance company profitability in the long-run, by building strong-integrated energy network from upstream to downstream to provide low-carbon energy solutions align with government regulations support, demand-side efficiency as well as carbon market price implementation that expected to reach minimum US\$ 50-75/tonCO₂eq to reduce GHG emission as a contribution to climate change mitigation.

Keywords – Strategy, Energy, Optimization Scenario, National Oil Company, Uncertainty, Climate Change.

I. INTRODUCTION

Indonesia as one of the Emerging Market and Development (EMDE) country has high dependency on oil as primary energy source to drive the economy for more than 200 million population. Since the year 2003 Indonesia has been a net oil importer to fulfill its energy demand due to the declining oil production that will pose a great threat to national energy security. Indonesia National Oil Company aims to ensure national energy security resiliency and self-sufficiency. However, the most important source of uncertainty for the company business development is the oil price volatility, where the dynamic will influence its strategic energy portfolio performance.

Demand cut during COVID-19 pandemic in the year 2020 has pushed the oil price to the lowest in history, impacting oil companies' revenue and profitability around the world, including the Indonesia National Oil Company which lost its overall revenue for 24.32% and profitability for 58% compares to the year 2019.

Economic downturn around the world in the year 2020 during COVID-19 pandemic has created opportunity to accelerate the transition towards low-carbon emission, align with the Indonesia updated Nationally Determined Contribution (INDC) to the United Nation Framework Convention on Climate Change (UNFCCC) in the year 2021 that committed to reduce Greenhouse Gas (GHG) emission to 29% unconditionally and 41% conditionally with internal support compared to Business as Usual (BAU) scenario in the year 2030 [20]. Indonesia National Oil Company has committed to reduce GHG emission to 78% from the year 1990 level by the year 2030 [9].

Therefore, Indonesia National Oil Company will require strategy to optimize its energy portfolio to enhance resiliency, agility and flexibility to unlock new value and bigger impact for stakeholders in facing the volatility of oil price, revenue and profit loss during Covid-19 pandemic in year 2020, technological advancement and the declined cost of renewable energy, countries increasing commitment towards net-zero emission target, Environmental, Social and Governance (ESG) investment trend of and oil reserves structural declined projection as an adaptive strategy towards climate change mitigation at corporate level in short, medium and long-term.

II. METHODOLOGY

Primary methodologies used in this research explained below:

- 1) Business performance analysis: Analyzing the company performance including financial, industry attractiveness, business unit competitive strength, current resource allocation, sustainability, innovation, as well as the R&D perspective to identify gaps and improvement opportunities in facing the challenges forward.

Company overall financial performance analysis explained as follows:

Table 1 - COMPANY OVERALL FINANCIAL PERFORMANCE [10]

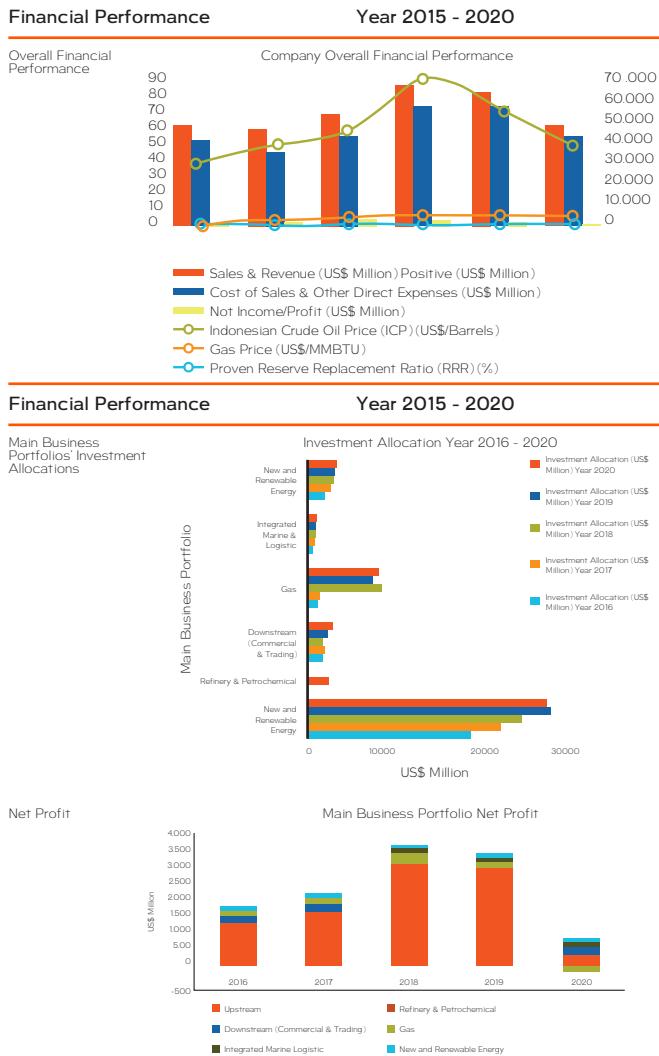


Table I shows that company financial performance was highly sensitive to oil price volatility, since oil contributes as the biggest share for 71% from the overall energy portfolio investment allocations, followed by 22% gas, and 7% of power, new and renewable energy, whereas cost-cutting was a reactive strategy to maintain profitability when oil price fall. Financial historical performance also showed that the company performed ideal when the oil price reached US\$60-70/barrel, however surging oil price > US\$100/barrel caused by energy supply disruption since the current unstable geopolitical condition will create greater risk of demand destruction in the long run that can put the company into the decline stage as the consumers tend to shift to the lower energy cost.

Evaluating industry-attractiveness of the overall main business portfolios as a whole business group to assess long-term performance prospect by calculating industry attractiveness scores as follows:

Table 2 - COMPANY INDUSTRY-ATTRACTIVENESS EVALUATION [17]

Industry-Attractiveness Measure	Importance Weight	Attractiveness Rating (1-10)*	Weighted Score
Market size and Projected Growth Rate	0.10	7	0.70
Intensity Competition	0.25	8	2.00
Emerging Opportunities and Threats	0.10	7	0.70
Cross-Industry Strategic Fit	0.25	8	2.00
Resources Requirements	0.10	7	0.70
Social, Political, Regulatory and Environmental Factors	0.10	5	0.50
Industry Profitability	0.10	7	0.70
Sum of Importance Weight	1.00		
Weighted Industry-Attractiveness Scores (Min. Acceptance = 5)			7.30

* Given by respondents; 1: Very Unattractive; 10: Very Attractive

Table II shows that weighted industry-attractiveness score is 7.30, indicates that the company is attractive as a whole business group since the presence of cross-industry strategic fit with attractive degree intensity level of competition as a potential competitive advantage to create added-value to stakeholders. However, there are social, political, regulatory, environmental factors, emerging opportunities and threats that potentially reduce the company industry-attractiveness as a whole business group that can affect its profitability, resource requirements, market size and projected growth rate in the future.

Evaluating the company main business portfolios' competitive-strength to determine current strong performance by calculating weighted competitive-strength as follows:

Table 3 - MAIN BUSINESS PORTFOLIOS WEIGHTED COMPETITIVE-STRENGTH SCORE [18]

Competitive-Strength Measures	Weight	Upstream		Refining & Petrochemical	
		Rating (1-10)*	Score	Rating (1-10)*	Score
Market Share	0.15	9	135	8	120
Cost relative to competitors	0.20	8	167	8	150
Ability beat rivals on key products attributes	0.05	8	0.40	9	0.43
Strategic-fit benefit	0.20	8	160	8	160
Bargaining leverage with suppliers/customers	0.05	9	0.45	8	0.40
Brand image & reputation	0.10	9	0.93	8	0.80
Other valuable resources/capabilities	0.15	9	1.35	7	0.98
Profitability to Competitors	0.10	8	0.83	7	0.70
Sum of Importance Weight	1.00		8.58		
Weighted Overall Industry Competitive-Strength Scores**					7.60

Competitive-Strength Measures	Weight	Commercial & Trading		Gas	
		Rating (1-10)*	Score	Rating (1-10)*	Score
Market Share	0.15	5	0.75	10	1.50
Cost relative to competitors	0.20	10	2.00	10	2.00
Ability beat rivals on key products attributes	0.05	10	0.50	10	0.50
Strategic-fit benefit	0.20	9	1.80	8	1.60
Bargaining leverage with suppliers/customers	0.05	9	0.45	6	0.30
Brand image & reputation	0.10	9	0.90	8	0.80
Other valuable resources/capabilities	0.15	9	1.35	9	1.35
Profitability to Competitors	0.10	8	0.80	7	0.70
Sum of Importance Weight	1.00				
Weighted Overall Industry Competitive-Strength Scores**			8.55		8.75

Competitive-Strength Measures	Weight	Integrated Marine & Logistics		Power, New & Renewables	
		Rating (1-10)*	Score	Rating (1-10)*	Score
Market Share	0.15	8	125	3	0.45
Cost relative to competitors	0.20	8	153	5	1.00
Ability beat rivals on key products attributes	0.05	8	0.40	8	0.40
Strategic-fit benefit	0.20	8	153	8	1.60
Bargaining leverage with suppliers/customers	0.05	8	0.40	8	0.40
Brand image & reputation	0.10	7	0.70	8	0.80
Other valuable resources/capabilities	0.15	8	120	8	1.20
Profitability to Competitors	0.10	8	0.80	8	0.80
Sum of Importance Weight	1.00				
Weighted Overall Industry Competitive-Strength Scores**		7.82		6.65	

*) Given by respondents; 1: Very Unattractive; 10: Very Attractive

**) Score > 6.7 (Strong) 3.3-6.7 (Moderate) 5 (Fair) 3.3 (Questionable) 3.3 (Weak)

Table III shows that gas portfolio currently is the strongest market contender in the industry with competitive-strength score > 6.7, whereas power, new and renewable energy portfolio considered as fairly-strong market contender in their respective industry with the competitive strength score below the strong and moderate competitive strength acceptance score.

Industry-attractiveness and competitive-strength score plotted on nine-cell matrix [18] to determine strategic position of each main business portfolio's priority for resource allocations as follows:

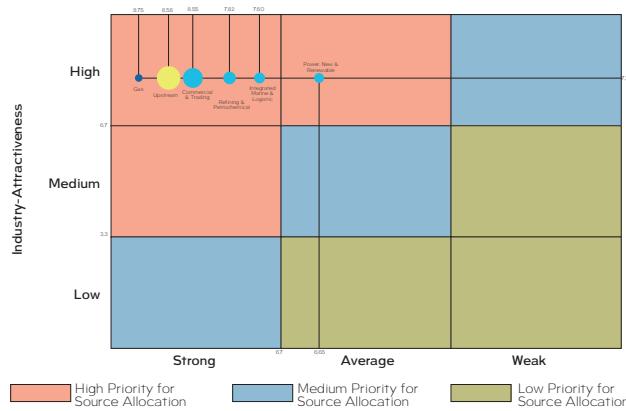


Fig. 1 Nine-Cell Attractiveness-Strength Matrix

Fig.1 shows that the overall main business portfolios currently positioned in the three cell in upper left position, which means that all have both favorable industry-attractiveness and competitive strength, where the bubbles are scaled to the percentage of the latest revenue generated to the total corporate revenue [18]. Although power, new and renewable energy portfolio competitive-strength is average compares to the others, it is generated positive revenue and profit during COVID-19 crisis, therefore company should consider to expand since its greater potential for profit growth.

Therefore, the company consider to have greater value of cross-business strategic fit resulting the more competitively powerful the company diversification strategy that creates opportunity to exploit competitive valuable in cross-business strategic fit [18]:

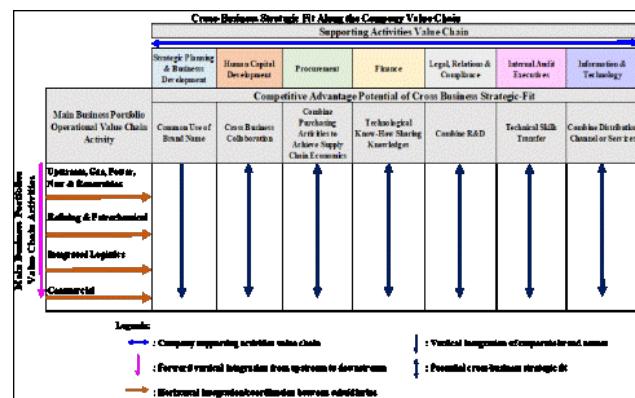


Fig. 2 shows that the company conducts forward vertical integration from upstream to downstream as corporate strategy, with main business group conduct horizontal integration strategy to conduct coordination between its subsidiaries in the value chain, where each owned profit and loss responsibility with guidelines received from the corporate. According to cross strategic-fit along the value chain analysis, the company exhibit resources-fit since its represent adequate resources including parenting and general resources to generate value, where each main business portfolio has different ability to generate cash flow from its operations, profitability and investment characteristic or financial-fit.

Based on the evaluation of diversified company strategy from industry-attractiveness, competitive-strength, strategic-fit and resource-fit, ranking main business portfolios' current priority for resources allocations as follows:

Table 4 - MAIN BUSINESS PORTFOLIOS CURRENT PRIORITY FOR RESOURCES ALLOCATIONS [18]

Main Business Portfolio	Operating Revenue Yr. 2020 (US\$ Million)	Net Profit Yr. 2020 (US\$ Million)	Competitive-Strength Score	Nine-Cell Position Matrix (H/M/L)*	Priority Rank for Resources Allocation
Upstream	7.728	321	8.58	H	1
Refining & Petrochemical	-	0.65	7.60	H	6
Commercial & Trading	4.517	263.53	8.55	H	2
Gas	3.292	(193.67)	8.75	H	3
Integrated Marine & Logistics	356	113	7.82	H	4
Power, New & Renewable Energy	356	87	6.65	H	5

*): H: High Priority; M: Medium Priority; L: Low Priority

Table IV shows that upstream oil and gas portfolio considered as the top priority for current resources allocation. However, since past performance is not always a reliable predictor to the future business performance, external and internal business environment analysis are required to improve the existing portfolio strategy, where there are possibilities to conduct trade-offs between each main business portfolio since the company's financial resources are limited, divesting or allocate minimum resources to the business with the weakest future prospect and lack of adequate strategic-fit and/or resource-fit is required to allocate the best of available fund to strengthen company's position and grow existing businesses.

Analyzing company sustainability [10] performance across main business portfolios and its interaction towards the company's economic activity as follows:

Table 5 - COMPANY SUSTAINABILITY PERFORMANCE YEAR 2018-2020 [11]

Sustainability Indicator [11]	SDG Transformation (COVID-19 Recovery) [19]	Interaction in Economic Activity (Trade-offs) [24] Score*	
		(+)	(-)
Environmental (E)	Energy Decarbonization and Sustainable Industry	17	-10
Social (S)	Education, Gender and Inequality; Health, Well-Being and Demography	15	-4
Governance (G)	Digital Solution for Sustainable Development; Education, Gender and Inequality; Health, Well-Being and Demography; Energy Decarbonization and Sustainable Industry; Sustainable Food, Land, Water and Oceans; Sustainable Cities and Communities	22	-8

(* Qualitative-quantitative analysis: 1 Point: (+) interaction; -1 Point: (-) interaction

Table V shows that the company ESG implementation across its main business portfolios align with the company sustainable policy [9] as the contribution to Sustainable Development Goals [19] has positive economic interaction where the governance indicator has higher economic interaction. However, the company needs to concern about ESG or SDG washing [21] since it potentially reduce value-delivered to stakeholders, therefore, good governance align with carefully calculated economic and benefit analysis in the implementation is strongly required.

According to the industrial life cycle stages [14], company's innovation current position is in the maturity [14] stage, with the composition represent below:

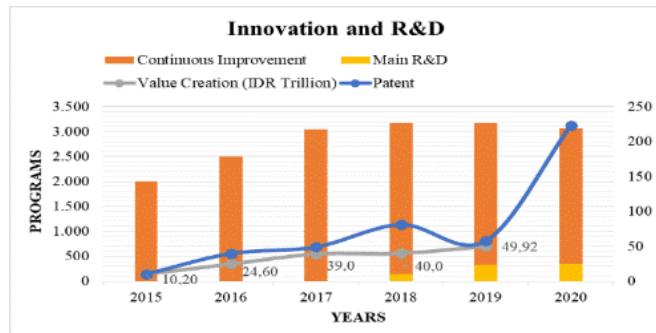


Fig. 3. Company Innovation and R&D [10]

Fig. 3 shows that continuous improvement programs were higher than the company's current main R&D programs. However, company require to consider in expanding and promoting R&D programs since the increasing uncertainties and climate change can create disruption that potentially change the whole company business strategy and model. Although the company already conduct digital transformation and mandatory human capital skill development of big data analytics, predictive maintenance and artificial intelligence as the extensive range of future business prospect and investment readiness, it is important for the company to develop data management awareness culture to enhance data quality across the organization, since data management and quality are fundamental in the big data analytics and artificial intelligence development.

2) Company characteristics: According to business performance analysis, company characteristics summarized below:

Table 6 - COMPANY CHARACTERISTICS

Market Type Characteristic [6]	Monopoly [6]	
- Number and size of firms - Type of product - Market entry and exit - Non-price competition	One Unique Very difficult or impossible Not Necessary	
Life Cycle Stages [14]	Maturity [14]	
Number and size of firms - Type of product - Market entry and exit - Non-price competition	Manufacturing, process engineering, marketing Product innovation low, process innovation high None-Moderate Largest Low - Numbers of Competitors - Mode of Competitions - Type of Buyers - Business-Level Strategy - Strategic Objectives	
Corporate Diversification Strategy [14]		
Type of Diversification	Revenue from Primary Businesses	
Dominant business	70%-95%	
Competencies (in products, services, technology or distribution)		
Source of Value Creation and Cost [14]		
Corporate Strategy	Sources of Value Creation (V)	Source of Cost (C)
Vertical Integration	- Lower costs. - Improve quality. - Facilitate scheduling and planning. - Facilitate investments in specialized assets. - Securing critical supplies and distribution	- Increase cost. - Reduce quality. - Reduce flexibility. - Increasing potential for legal repercussion

Risk Management Three Lines of Defense – Risk Profile and Mitigation [11]			
Risk Profile	Monopoly [6]	Monopoly [6]	
Strategic Planning	- Risk related to corporate strategy and planning, e.g. achievement of oil and gas production.	- New reserve explorations, discovery, crude oil product diversification, new and renewable energy development	- Bank Indonesia maintained interest rates at 3.5% in the year 2022 before gradually raising rates as inflation emerges.
Financial	- Risk related to financial activities, market, planning & budgeting, e.g. global bond, corporate loan.	- Foreign exchange hedging transaction, attempt competitive loan interest rate and market risks analysis	- Ministry of Finance projected inflation rate to increase from 1.6% in the year 2021 to become approximately 2.2% to 3% with 1% deviation in the year 2022-2025.
Operational & Infrastructure	- Risk related to company operational & infrastructure activity.	- Increase employee safety awareness, asset optimization, rejuvenation and renewed technologies	- Indonesia National Development Agency projected per capita income to reach US\$ 6,305/year in 2025 and US\$ 8,804/year in 2035.
Governance	- Risk related to compliance in corporate governance & business ethics	- Optimization, adjustment and top-down approach in the implementation	- Domestic unemployment rate decrease from 6.26% in the year 2021 to become 5.83% in February 2022 and projected to decrease approximately from 7% in the year 2020 to become 6% in the year 2022 [2].
Compliance	- Risk related to Good Corporate Governance (GCG) and fraudulent act	- Whistle blowing, audit ISO37001 of Anti-Bribery Management System Certification and Implementation	- Indonesia Rupiah's exchange rates projected to ranged 14,600 – 15,600/US\$ in the year 2022-2023. In January 2022, Indonesia Rupiah value depreciated by 0.77% and 0.01% on average according to NDF.
Reporting	- Risk related to company performance report submission to the concerned stakeholders	- Periodic data reconciliation, business control implementation improvement	- Domestic trade balance surplus for US\$ 0.93 million in January 2022, with the biggest contributor came from non-oil and gas sectors for US\$2.26 million, whereas oil and gas sectors contributed to the trade balance deficit for US\$1.33 million [2].

3) Business environment analysis: Analyzing recent external and internal business environment and its impact both pros and cons to the current company business activities as well as to influence the company's business strategy in the future, explained as follows:

Table 7 - EXTERNAL ENVIRONMENT ANALYSIS [18]

Political Forces (P)	Impacts to Current Strategy	Economic Forces (E)	Impacts to Current Strategy
- Constitution of Republic Indonesia No. 19 year 2003 Article 66 concerning Public Service Obligation (PSO) for State-Owned Enterprise (SOE)	- Unbalance between PSO funds and the obligations potentially creates deficit for company cash flows and reduce its profitability and creditworthiness, and vice versa.	- Indonesia population number projected to increase between 292.5 – 311.6 million people in the year 2030-2045 with growth rates 0.57% in year 2030-2035 and 0.28% in year 2040-2045 [2].	- Increasing company productivity resulting higher scale of production, reduce cost of production, and market expansion by providing enough labor force. However, population growth's rapid increase may increase energy consumption, leads to the increase in natural resources scarcity, decreasing environmental aspect, e.g. pollution, uncontrolled urbanization, and deforestation.
- Republic of Indonesia Presidential Regulation No.55 Year 2019 concerning the acceleration of Battery Electric Vehicle (BEV) for road transportation.	- Increasing risk of business portfolio disruption, particularly in upstream, refining and petrochemical and fuel retail business.	- Population migration from rural to urban area or urbanization level projected to increase to become 66.6% in the year 2035, reaching 203 million [2] [21].	- Ease production inputs, facilitating information exchanges that stimulate innovations, business and market expansion. However, market development in rural areas require bigger capital since limited infrastructures.
- Appendix Presidential Regulation No. 18 year 2020 concerning the National Medium-Term Development Plan year 2020-2024.	- Refinery Development Master Plan (RDMP1) city gas network and the sustainable electricity creating business opportunities for refining and petrochemical, gas, power, new and renewable energy portfolio development.	- Increasing urbanization caused work patterns changed from agrarian to industrial based, where the working population in urban areas currently reached 54.09%, with 36.37% category as laborers/employees from the total population [2] that may contributes to the shift in transportation and households sectors as well as the increase in infrastructures and industrialization that increase energy demand.	- Wider business and market opportunities, development and expansion to increase company revenue and profitability. However, rapid urbanization can potentially increase environmental problems, therefore demand-side efficiency, particularly in urban areas.
- Law of the Republic Indonesia No. 7 year 2021 concerning the tax harmonization.	- Carbon tax payment on business activities that produce carbon emission for IDR 30,000 per kgCO2e started on July 2022 (coal-powered generation as pilot project implementation).	- Transportation sector currently contributes to the biggest share of final energy consumption for 43.1%, particularly in fuel products [2].	- Business opportunities to increase company revenue. However, the increase in fuels consumptions lead to the increase in crude oil imports and GHG emission. Therefore, demand-side efficiency align cleaner energy technologies development in transportation sector are required.
- Government of Indonesia Regulation No. 25 year 2021 concerning the implementation of energy and mineral resources.	- Energy mix utilization for power generation activity such as: fossil fuels and new and renewables, including: battery energy storage system, geothermal activities, including: exploration, exploitation, etc.	- Industrial sector contribute as the 2nd biggest share of final energy consumption by 34.07%, where gas contributes by 33.47% from total power generation that gradually decrease compared to coal-powered generation according to Ministry of Energy and Mineral Resources.	- Business opportunities to increase company revenue, particularly for gas portfolio. However, increasing energy consumption in the industrial sectors also contributes to the increase in GHG emission and the carbon tax implementation, therefore company requires to consider developing cleaner energy technologies along with demand-side efficiency.
- Ministry of Energy and Mineral Resources Regulation No. 8 year 2020 concerning the determination of the US\$ 6/mmbtu gas pricing for certain industry.	- Increase the revenue stream particularly for gas portfolio. However, the utilization of gas price for US\$ 6/mmbtu for certain industries mentioned currently still below 100% target (81%), prolonged by demand cut during COVID-19 pandemic recovery that can put company's profitability at risk.	- Households sector currently contributes as the 3rd biggest share of final energy consumption by 16.80% where electricity generation contribute by 50.80%, followed by LPG for 47.01% whereas gas only contributes for 0.19% [8].	- Business opportunities to increase company revenue, e.g. gas-powered electricity generation and gas transmission network for households align with government medium-term agendas in reducing GHG emission by reducing LPG import and subsidies along with demand-side efficiency.
- Ministry of Energy and Mineral Resources Regulation No. 10 year 2020 concerning the utilization of natural gas utilization for electricity generation.	- Increase the revenue stream particularly for gas portfolio. However, prolonged demand cut during COVID-19 pandemic can put company's profitability at risk since decreasing utilization.	- Commercial sector currently contributes as the 4th biggest share of final energy consumption by 4.79%, where the share of electricity is 80.59% with coal-steam powered generation contributes by 41.58% from the total electricity generation [8].	- Business opportunity to increase company revenue particularly for power, new and renewables, as well as gas portfolio, e.g. gas powered generation for commercials align with government medium-term agendas in reducing GHG emission.
- Updated Nationally Determined Contribution (NDC) Republic of Indonesia year 2021 concerning the 29% reduction on GHG emission and 41% conditionally by international support in the year 2030.	- Establishment of GHG emission reduction target for 29% from 2020 level in the year 2030, thus, creating investment gap to reduce GHG emission below targeted level that potentially increase company's expenditure.	- Rural area population currently contribute by 45.91% from the total populations, where the government currently developing new market for renewables through Renewable Based Economic Development Program aiming to accelerate renewable energy utilization particularly in local economic zone in remote, outer rural areas [2].	- Business opportunity to increase company revenue particularly for power, new and renewable energy portfolio. However, providing energy in rural areas often challenged by grid reliability and energy distribution since its complicated geographical conditions, therefore, decentralized energy solution might be suitable for rural areas.
Economic Forces (E)	Impacts to Current Strategy	Technological Forces (T)	Impacts to Current Strategy
- Bank Indonesia projected domestic economic growth to increase between 4.7-5.2% in the year 2022-2023, assumed faster COVID-19 recovery, between 5-6% in the year 2045, 2.8% in the year 2050 and 2.17% in the year 2060 [12].	- Increase buyers' purchasing power that increase company profitability to fund business development, expansion, investment, innovations, R&D and vice versa.	- Digital technologies currently widely used in all energy end-use sectors, offering large improvement in energy efficiency, where	- Improve company performance in terms of operational efficiency, demand-side management to increase energy savings, and

Technological Forces (T)	Impacts to Current Strategy	Impacts to Current Strategy
<ul style="list-style-type: none"> - Digital technologies currently widely used in all energy end-use sectors, offering large improvement in energy efficiency, where the investment projected to increase between the years 2021-2023 [4]. - Biofuels currently being able to produce from the existing petroleum refinery facilities around the world [4], where Indonesia currently conduct feasibility study and business plan of Industrial Vegetable Oil/Industrial Lauric Oil (IVO/ILO) as raw material for Green Fuel/B100 according to Ministry of Industry. 	<ul style="list-style-type: none"> - Improve company performance in terms of operational efficiency, demand-side management to increase energy savings, and the fastest way to reduce GHG emission in the short-term. - Green refinery development projected to on-stream in the year 2024 to increase biodiesel-fuel blending production capacity and green diesel (D100) planned on-stream in the year 2022 in refining and petrochemical portfolio. However, increasing palm oil plantation as biofuel feedstock leads to the increase of deforestation in medium-long term. Therefore, company requires to consider other cleaner fuel technologies R&D as an alternative to biodiesel blending in the long-run. 	<ul style="list-style-type: none"> - Global pandemic slow recovery, since China announced lockdown, appearance of new cases of new variants also contributes to slow down the global economic growth, where forecast to drop between 3.1-3.6% in the year 2022-2023 according to Health Ministry. - Indonesia average air temperature increase 0.3C in March 2022, the 9th highest anomaly since the year 1981 according to Indonesia Meteorology, Climatology and Geophysics Agency. - Rainfall intensity of 20 mm/day category tends to increase by 0.624% every decades according to Indonesia Meteorology, Climatology and Geophysics Agency. - Increasing rainfall intensity would create higher risk of flood, landslide and lightning intensity that put operating facilities at risk (damage) and the projects delay that can reduce company performance e.g. increasing emergency or unexpected expenditures.
<ul style="list-style-type: none"> - Global electric cars stock increase 43%, followed by more than 10 largest global manufacturers plan to reconfigure their product lines to produce and sell only electric vehicles started from the year 2030 [4]. 	<ul style="list-style-type: none"> - Major shift in fuel demands in transportation sectors that potentially disrupt the entire company business model, strategy, value chain and profitability from upstream to downstream that threaten company position as the market leader. Hence, demand-side efficiency align with other cleaner energy technologies as an alternative is required since rapid increase of battery electric vehicles raw materials' mining can increase environmental degradation. 	<ul style="list-style-type: none"> - Law of the Republic Indonesia No. 22 year 2001 concerning the implementation of oil and gas business activities also the establishment of the company as limited corporation state-owned enterprise.
<ul style="list-style-type: none"> - Weighted-average renewables power generation LCOE are projected to gradually fall since the technological advancement, declining learning curves and decreasing Q&M cost and debt are already very low in mature markets according to International Renewable Energy Agency (IRENA) 	<ul style="list-style-type: none"> - Increase revenue stream for power, new and renewable energy portfolio in medium-long term. However there are main barriers, including investor's sentiment towards the company new and renewable energy portfolio since the newly established (5 years) technologies requirement for stabilized new and renewable energy supply, e.g. energy storage, centralized electrification system creates uncompetitive tariffs from monopoly power-off taker. 	<ul style="list-style-type: none"> - Production Sharing Contract (PSC) agreement as oil and gas contractor under Special Task Force to conduct upstream oil and gas business activities, both in the form of cost-recovery and gross-split scheme. However, declining RRR and longer bureaucracy in oil and gas investment can put the overall company profitability at risk since it is contribute for more than 50% of main business portfolio, while the amendment of the law is uncertain.
<ul style="list-style-type: none"> - Battery storage technology capital cost evolved rapidly in the past few years which projected to reduce by approximately between 6%-48% in year 2025, 26%-63% in the year 2030 and 44%-78% in the year 2050. However, fossil-fuels powered generators in various industrial sectors' sales market size expected to grow at 5.79% during the year 2021-2028 since demand for renewables and electricity increase [4]. 	<ul style="list-style-type: none"> - Increase revenue stream for downstream, power, new and renewable energy portfolio in the long-run but potentially reduce the revenue in upstream oil and gas portfolio that affects company profitability. However, upstream oil and gas potentially generates higher revenue stream in short-medium term but, declining RRR, capital-intensive investments, oil price volatility, GHG emission and ESG investment trend will put the upstream investment in higher risk, therefore, disciplined capital allocation align with carefully calculated cost and benefit analysis, good governance, innovations, operational efficiency, and asset optimization (potentially combined between divest and invest) are required. 	<ul style="list-style-type: none"> - Built-own-operate-transfer scheme elimination increasing new and renewable energy investment attractiveness potentially increase the revenue stream particularly for power, new and renewable energy portfolio.
<ul style="list-style-type: none"> - More than 30 new integrated CCUS facilities that have been announced since 2017 around the world, represent total investment for > US\$ 27 billion almost doubled from 2010 level, where at least 7 large-scale integrated CCUS projects have been at early stages of planning in Southeast Asia, particularly related to enhanced gas recovery projects (EGR) in Gundih/Sukowati and Tangguh, Indonesia [4]. 	<ul style="list-style-type: none"> - Achieve GHG emission reduction target particularly in natural gas processing activities. However, CCUS development is capital and energy-intensive so that carefully calculated economic and benefit analysis are strongly required to determine the economic feasibility in accordance to the carbon market implementation. Integrated CCUS development that captured CO2 and transformed it into useful commodity material and chemicals will increase the economic feasibility as well as reduce GHG emission. 	<ul style="list-style-type: none"> - Ministry of Energy and Mineral Resources Regulation No. 4 year 2020 amendment from Regulation No. 50 year 2017 concerning renewable energy utilization for electricity supply. - Ministry of Energy and Mineral Resources Regulation No. 12 year 2020 amendment from Regulation No. 20 year 2019 concerning the update on regulation for Gross-Split Production Sharing Contracts (PSCs) - Ministry of Energy and Mineral Resources Decree No. 13 year 2020 concerning the implementation of LNG supply, infrastructure development and conversion for electricity supply. - Government of Indonesia Regulation No. 44 year 2021 concerning the prohibition against monopolistic practices and unfair business competition. - Ministry of Energy and Mineral Resources Regulation No. 24 year 2021 concerning the provision and utilization of biodiesel in the palm oil plantation fund management agency's financing framework. - Ministry of Energy and Mineral Resources Regulation No. 26 year 2021 concerning the roof-top solar PV network utilization for public interest. - Ministry of Energy and Mineral Resources Regulation No. 69 year 2021 concerning the fuel retail price, supply and distribution.
<ul style="list-style-type: none"> - Global capacity of electrolyzer that produce hydrogen from electricity doubled for the past five years to reach 300 MW by 2021 with under 350 projects under development that could increase global capacity up to 34 GW by the year 2030. Significant production cost-cutting through technology innovations and increasing development that projected to fall as low as US\$ 1-3/kW in countries with excellent renewable resources compares to the production cost of hydrogen from natural gas with CCUS in the year 2030, making hydrogen production from solar-PV getting more cost-competitive [4]. 	<ul style="list-style-type: none"> - Increase revenue stream and reduce GHG emission, particularly for natural gas processing, downstream, refining and petrochemical power, new and renewables portfolio e.g. by establishing integrated hydrogen hub in the long-run. However, rapid technological advancement align with the decreasing hydrogen production cost will creates major shift in fuel demands, that can disrupt the entire company business model, strategy and value chain from upstream to downstream that can put company profitability at risk in the long-run. Therefore, company established research and technology center that focused on R&D, particularly in hydrogen utilization roadmap. 	<ul style="list-style-type: none"> - Potentially increase revenue stream, particularly for gas portfolio. However, the uncertainty of COVID-19 pandemic recovery can prolonged demand cut that contributes to the underachievement of gas utilization. - Company must ensure to avoid monopolistic practices and unfair competition in conducting business activities. - Ensure biodiesel raw material feedstock, production and quality align with biodiesel blending mandates from the government. However, comprehensive monitoring and evaluation is required to maintain product quality. - Increase revenue stream particularly for power, new and renewable energy portfolio, however the implementation currently still below expectation. - Prolonged volatility of oil price for more than US\$ 100/barrel put the company profitability and cash flow at risk in the short-run, since the unbalance between fuel and other petroleum products e.g. LPG retail price obligation and cost of production, in addition due to dependency on oil imports.

Although the company subject to monopoly practices by pricing power, assessing the current industry dynamic environment is required since the establishment of antitrust policy that potentially increase business competition, which identified by five-forces framework [18] below:

Main Competing Sellers	Degree of Rivalry (S/M/W)*	Types of Competitive Weapon
- Other upstream oil and gas contractors	S	- Higher RRR, lower cost/barrel to boost sales volume and increase revenue and profit.
- Other refinery & petrochemical businesses	W	- Broadens access to buyers by building better dealer network.
- Other fuels, other petroleum products and services	M	- Perceived value to increase revenue and market share, likely to increase cost.

Strategic Energy Portfolio Optimization for National Oil Company amidst Uncertainties and Climate Change

- Other gas distribution services	W	- Broadens access to buyers by building better dealer network.
- Other new and renewable energy producers	S	- Broadens access to buyers by building better dealer network.

*S : Strong; M: Moderate; W: Weak

B. Competitive Pressure of Potential Entrance

Potential Entrance	Entry Barriers (H/L)*	Expected Defending Action against New Entry
- Energy businesses' disruption strategy towards low-carbon energy technology portfolio	L	- Main business portfolios optimization, build strong-integrated energy network from upstream to downstream, strategic partnership with high-qualified suppliers/competitors, accelerating R&D, acquiring new ideas from start-ups that align with company strategy.
- Low-carbon energy technology's start-ups	H	

*H: High; L: Low

C. Firms In Other Industries Offering Substitute Product

Firms Offering Substitute Products	Competitive Pressure (S/W)*	Explanation
- EV charging station development by state-owned enterprise	S	- Increase competitive pressure since the competitor investing in added capacity.
- EV charging station development by EV manufacturers.	S	- Manufacturers' EV ecosystem increase competitive pressure.
- Oil companies' EV charging station development	W	- Market power currently dominated by state-owned enterprise and manufacturers.
- Coal-fired power generation	S	- Coal-fired power generation offering stable electricity supply as an alternative substitute for gas.

D. Suppliers Bargaining Power

Suppliers	Bargaining Power (S/W)*	Explanation
- Goods and services suppliers across main business portfolios	S	- Dominated by a few large suppliers, where state-owned enterprises required to conduct synergy, goods and services fabricated or produced domestically by developing local labors unless the technologies are unavailable or lack of capabilities in domestic market in terms of procurement of goods and services, and registered in Indonesia Special Task Force for Upstream Oil and Gas Activities for upstream oil and gas procurement.

*S: Strong; W: Weak

E. Buyers Bargaining Power

Buyers	Bargaining Power (S/D)*	Explanation
- Government	S	- Well informed about the quality, prices and costs of sellers. Ability to postpone PSO compensation.
- Fuel and petroleum products retail consumers	S	- Buyers are price-sensitive where the majority earn low income.
- Household sector gas consumers	S	- Buyers are price-sensitive where the majority earn low income.
- Industry sector gas buyers	S	- Buyers have the ability to cancel purchasing agreement.
- New and renewable energy power off-taker	S	- Buyers are currently the only and large relative to number of industry sellers.

*S: Strong; D: Decrease

Assessing current internal environment condition to determine company strengths and weaknesses to build its strength in seizing new business opportunities and how to mitigate external threats as follows:

Table 9 - SWOT ANALYSIS [18]

Strength & Competitive Assets (S)	Weakness and Competitive Deficiencies (W)
✓ Strong presence, brand image and reputation in domestic market.	- Highly sensitive to external threats, e.g. oil price volatility, regulations.
✓ Wide geographical distribution capabilities.	- Difficulties in business operational monitoring since wide-geographical coverage and distribution.
✓ Market domination by pricing power.	- Declining RRR, internal operating problems, obsolete, under-utilized.
✓ Diversified business portfolio from upstream to downstream.	- Minimum R&D, lack of digitalization and data management culture.
✓ Stable [11] credit risk rating and Medium-Risk [12] sustainability rating.	- Uneven human capital competencies, talent and career development.
	- Highly exposure of conflict of interest.

Company has strong presence, brand-image and reputation in domestic market with wide-geographical coverage and distribution capability, broad low-cost and strategic-fit between its diversified main business portfolios from upstream to downstream. However, declining RRR, aging facilities, difficulties in operational monitoring since wide-geographical coverage, uneven human capital competencies to adapt with the current business situation, lack of digitalization and data-driven culture and highly exposure to conflict of interest contributes to the underperformance.

Market Opportunities (O)	Current External Threats (T)
✓ Low-carbon fuels production by strongly-integrating upstream to downstream business portfolio. ✓ Investing or acquiring new clean energy technologies or ideas from start-ups, small-medium enterprises that align with company strategy. ✓ Strengthen and expand current domestic commercial business by improving product quality and services. ✓ Battery storage business development to stabilize the utilization of new and renewable energy power generation by strategic partnership with high-experience and qualified parties, with environmental aspect consideration.	- Prolonged COVID-19 pandemics and global energy supply disruption increase the oil price volatility. - Prolonged PSO compensation can put company cash flow, profitability and credit worthiness at risk. - Rapid technological advancement in cleaner energy technologies can increase black-swan [25] risk that potentially disrupt the current company business strategy & model. - Carbon tax implementation for business that emit CO2, can put company profitability at risk. - Increasing air temperature and rainfall intensity that caused drought, flood, landslide, lightning and sedimentation that can put the overall company performance at risk.

Implication to Improve Current Company Strategy (O-T)

Company already has diversify integrated business from upstream to downstream that creates opportunities to develop cleaner energy in the future. However, company overall performance is highly sensitive to external environment, e.g. volatility of oil price, regulations, rapid technological advancement of cleaner energy that potentially disrupt the whole company business model and strategy, increasing competition, which can reduce company profitability in the long-run. Therefore, it is require to conduct strategic energy portfolio optimization to enhance company resilience during uncertainty condition while reducing GHG emission.

Analyzing internal important resources and capabilities to measure company's competitive assets to measure whether it can support a sustainable competitive advantages over market rivals and business strategy as follows:

Table 10 - VRIO ANALYSIS [14]

Resources	Type (T/I)*	Valuable (V)	Rare (R)	Costly to Imitate (I)	Organized to Capture Value (O)	Competitive Advantages (S/D/P/T)*
A. Physical Resources						
Land Building	T	✓	✓	✓	✓	S
Plants	T	✓	✓	✓	X	T
Distribution	T	✓	✓	✓	X	T
Integrated Network	T	✓	✓	✓	X	T
Natural Resources						
Access Right	T	✓	✓	✓	X	T
B. Financial Resources						
Cash Equivalent	T	✓	✓	✓	X	T
Marketable Securities	T	✓	✓	✓	✓	S
Credit Ratings	T	✓	✓	✓	X	T
Borrowing Capacity	T	✓	✓	✓	X	T
C. Technological Assets						
Patents	T	✓	✓	✓	✓	T
Copyrights	T	✓	✓	✓	✓	T
Production						
Technology	T	✓	✓	✓	✓	T
Innovation Technology	T	✓	✓	✓	✓	T
Technological Process	T	✓	✓	✓	✓	T
D. Organizational Resources						
IT Servers, Workstation, Communication System, etc.	T	✓	✓	✓	X	T
Planning, Coordination and Control System	T	✓	✓	✓	X	T
Organizational Design	T	✓	✓	✓	X	T
Reporting	T	✓	✓	✓	X	T
E. Human Assets and Intellectual Capital						
Education, Experience, Knowledge, Talent, Learning, Tacit Knowledge	I	✓	✓	✓	X	T
Intellectual Capital and Work Group	I	✓	✓	✓	X	T
Managerial & Leadership Skill	I	✓	✓	✓	X	T
F. Brands, Company Image, Reputational Assets						
Brand Names, Trademarks, Products, Company Images	I	✓	✓	✓	✓	S
Loyalty and Goodwill	I	✓	✓	✓	✓	S
Quality, Service, Reliability	I	✓	✓	✓	X	T
Reputation with Supplier and Partners	I	✓	✓	✓	✓	S
G. Relationships						
Alliances, Joint Ventures, Partnerships	I	✓	✓	✓	✓	S
Network Dealers, Distributor	I	✓	✓	✓	✓	S

H. Company Culture and Incentive System							
Business Behavior Principles	I	✓	✓	✓	X	T	
Ingrained Beliefs within Company Personnel	I	✓	✓	✓	X	T	
Attachment to Company Ideals Compensation System	I	✓	✓	✓	X	T	
Motivation Level of Company Personnel	I	✓	✓	✓	X	T	

*) T: Tangible; I: Intangible **) S: Sustainable; D: Disadvantages; P: Parity; T: Temporary

Table X shows that company has sustainable competitive tangible both physical and technological assets as well as intangible brand images, reputation and relationship with partners. However, access right of natural resources e.g. oil is considered as temporary competitive, product and quality considered as temporary since it is required to improve as the competition increase, postponed compensation from the government that put company cash flow at risk since it can reduce credit ratings and borrowing capacity. Building excellent company culture and human capital are essential for the company to align between human capital capabilities with business strategy to increase productivity and giving sustainable added-value to stakeholders, where productivity and added-value overtime will create sustainable competitive advantage.

Analyzing stakeholders' impact to recognize, prioritize and address the needs of different stakeholders to manage effectively in order to gain sustainable competitive advantage as a strategic stakeholder management, where the stakeholders involved identified below:

Table 11 - STAKEHOLDER IMPACT ANALYSIS [14]

Stakeholders	Power Interest	Opportunities to Company	Threats to Company	Company Responsibility (Economic/ Legal/Ethical)	Company Action
A. External Stakeholders					
Suppliers	High Power/ High Interest	Collaboration, exchange knowledge	Increase bargaining power, reduce ability to determine reasonable price	Economic, Legal and Ethical	Engage closely with GCG [18]
Alliance Partners	High Power/ High Interest	Expand market-share, exchange knowledge, collaboration	Under-performance different goals & potentially creates conflict	Economic, Legal and Ethical	Engage closely with GCG [18]
Buyers	High Power/ Low Interest	Pricing-power	Reduce company profitability since consumer tend to economize	Economic	Diversify portfolio, demand-side efficiency
Government	High Power/ Low Interest	Legal certainty	Legality uncertainties, unsupportive regulation	Economic, Legal and Ethical	Maintaining relationship, monitoring, evaluation, reporting
Union	High Power/ Low Interest	Increase productivity	Conflict of interest	Economic, Legal and Ethical	Engage closely with GCG [18]
Creditors	Low Power/ High Interest	Increase capitals for business expansion	Financial under-performance	Economic, Legal and Ethical	Maintain relationship
Communities	Low Power/ High Interest	Increase image enhancement	Conflict of interest	Economic, Legal and Ethical	Maintain relationship
Media	Low Power/ High Interest	Increase image & reputation	Conflict of interest	Economic, Legal and Ethical	Monitoring, evaluation
Competitors	Low Power/ Low Interest	Increase performance, innovation, R&D	Unhealthy competition	Ethical	
B. Internal Stakeholders					
Employee	High Power/ High Interest	Increase productivity, organizational alignment	Difficulties in talent development, monitoring & evaluation	Economic, Legal and Ethical	Build excellent company culture
Commissionaire	High Power/ Low Interest	Aligning company aspiration & strategies with government agendas	Potential conflict of interest	Economic, Legal and Ethical	Credible & transparent performance reporting
C. Decision Makers					
Chief Executive Officer (CEO)	High Power/ High Interest	Providing strategic direction	Potential conflict of interest	Economic, Legal and Ethical	Credible & transparent performance reporting
Board of Directors (BOD)	High Power/ High Interest	Aligning CEO strategic direction to the organization	Potential Conflict of interest	Economic, Legal and Ethical	Credible & transparent performance reporting
Senior Executives	High Power/ High Interest	Providing business unit's strategic direction align with BOD & CEO	Potential Conflict of interest	Economic, Legal and Ethical	Credible & transparent performance reporting

4) Strategic Formulation: Strategic formulation [14] to optimize energy portfolio as well as to unlock new values as an adaptive strategy towards climate change mitigation in corporate level, conduct as follows:

Driving forces [3] identified from both external and internal business environment analysis in the industry and the impacts against the current corporate energy portfolio strategy represent below:

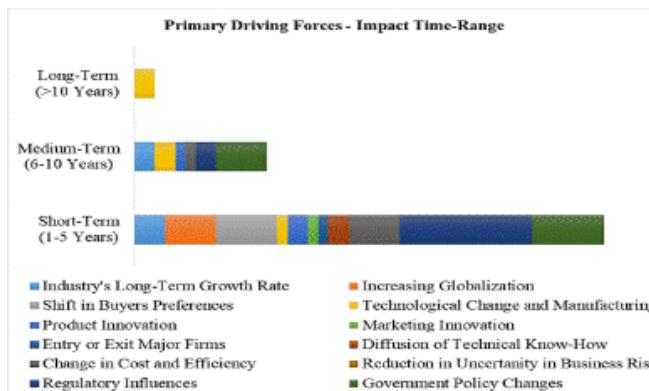


Fig. 4. Driving Forces Impact Time Range

Fig. 4 shows that regulatory influence, government policy changes shift in buyer preferences, increasing globalization, change in cost and efficiency projected to give short-term impact to the current corporate strategy. However, technological advancement in cleaner energy technologies potentially increase black-swan [25] effect that cause disruption to the current corporate's energy portfolio strategy in short, medium, or even long term, since the increase in regulatory, legal and bureaucratic risk, where the former issues usually reflects on administrative barriers and catastrophic risk since widespread events create several impacts in the occurrence area, e.g. socio-political instability, epidemics and natural hazards.

Analyzing critical uncertainties [3] that influence the driving forces since it is difficult to assign any probabilities of future random events, represent as follows:

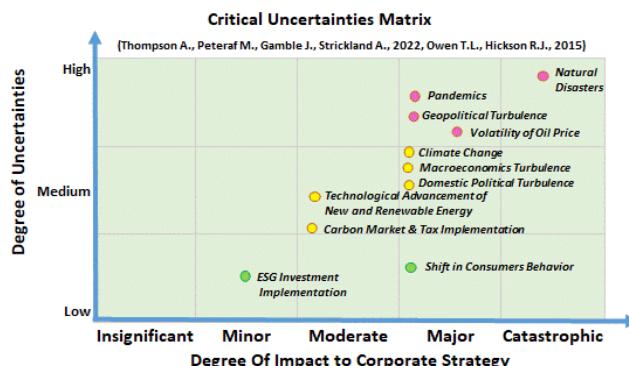


Fig. 5. Critical Uncertainties Matrix

Fig. 5 shows that oil price volatility, both fall and surging can reduce the ability of the current corporate's energy portfolio strategy to achieve profitability. Therefore, the company required to build shock-absorber in mitigating the consequences or disturbances of the critical uncertainties to enhance its resiliency in ensuring national energy security to be equally accessible and affordable throughout society while reducing GHG emission.

Optimizing current company energy portfolio strategy to improve long-term company performance using scenario planning approach to anticipate plausible future and influence future decision [14] conducts as follows:

Analyzing system dynamic [1] of interdependency and interactions between company's current energy portfolio strategy, external-internal business environment, critical uncertainties, and the interventions:

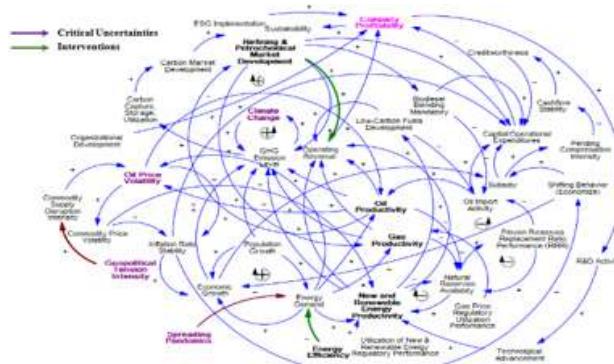


Fig. 6. Company's Strategic Energy Portfolio Optimization System Dynamics Model

Fig. 6 shows that energy efficiency intervention in the demand-side expected to increase energy saving in oil consumption to reduce oil import to enhance cleaner energy technologies development in short-term. Integrated refining and petrochemical market development aims to optimize the existing portfolio to generate new revenue stream to enhance profitability in short-medium term, to give additional fund for the company to increase its R&D in cleaner energy technologies to prevent major disruption in the long-run, by creating strong-integrated energy network from upstream to downstream align with GHG emission monetization from CO₂ capturing activity, e.g. utilization for industrial purpose to minimize stranded

assets. There are several scenarios of energy portfolio composition to optimize the outcomes, conduct using stock and flow diagram simulation [1] in accordance to Fig.4:

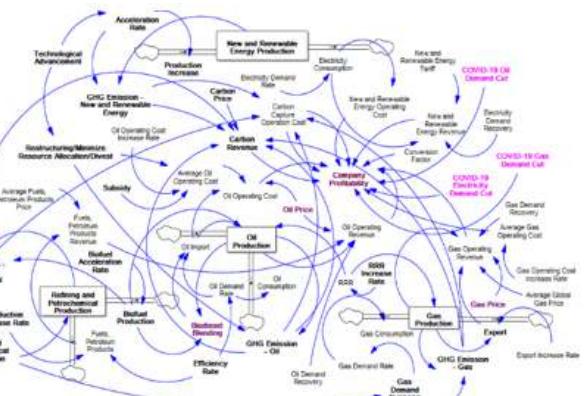


Fig. 7. Stock and Flow Diagram

Stock and flow diagram scenario simulation's primary equations described in the table below:

Stock and flow diagram scenario simulation's primary equations described in the table below:

Table 12 - STOCK AND FLOW DIAGRAM EQUATIONS

Variables	Unit	Initial Value	Primary Stock
			Equations
Oil Production	Barrels Oil/Day	870,000 [10]	(Oil Import-Oil Consumption-Biofuel Production) ^{RRR} (-Biofuel Production-Fuels, Petroleum Products) ^{Integrated Petrochemical Acceleration}
Refining and Petrochemical Production	Thousand Barrels	300,000 [10]	-Gas Consumption+(Gas Production ^{RRR})-Export
Gas Production	Million Standard Cubic Feet/Day	2,634 [10]	(Oil Import-Oil Consumption-Biofuel Production) ^{RRR} (-Biofuel Production-Fuels, Petroleum Products) ^{Integrated Petrochemical Acceleration}
New and Renewable Energy Production	Gigawatt hour	4,637 [10]	Production Increase-Electricity Consumption (Oil Demand Rate)-Biodiesel Blending Oil Consumption *Oil Demand Rate Oil Demand Rate *Efficiency Rate Assumption
Oil Import	Barrels Oil/Day	110,000 [8]	Proven Reserves Replacement Ratio (RRR)-RRR Increase Rate ((Oil Production/365) ⁷)
Oil Consumption	Barrel Oil/Day	14e+06 [8]	(GHG Emission - Oil) ⁷ ((Restructuring/Minimize Resource Allocation/Divestiture) ⁷)
Oil Demand Rate	1/Year	0.021 [12]	Biofuel Production "Biofuel Acceleration Rate"
Oil Price	US\$/Barrel	30,60,120	Electricity Consumption *Electricity Demand Rate
RRR	Dmrl	1.02 [11]	Fuels, Petroleum Products -(Fuels, Petroleum Products) ^{*Efficiency Rate} ((Fuels, Petroleum Products) ^{Production Increase Rate})
GHG Emission-Oil	Million TonCO ₂ eq/ Day	0.0217 [12]	(GHG Emission - Refining & Petrochemical Production/365) ⁷
Biofuel Production	Barrels Oil/Day	0.5438 [10]	(GHG Emission - Refining & Petrochemical Production/365) ⁷
Electricity Consumption	Gigawatt hour/ Day	1270 [10]	(GHG Emission - Refining & Petrochemical Production/365) ⁷
Fuels, Petroleum Products	Barrels Oil/Day	82,19 [10]	Production Increase New and Renewable Energy Acceleration Rate
GHG Emission - Refining & Petrochemical Production	Million TonCO ₂ eq/ Day	0.02 [10]	Production Increase New and Renewable Energy Acceleration Rate
Production Increase New and Renewable Energy	Gigawatt hour	3,000 [10]	Production Increase New and Renewable Energy Acceleration Rate
GHG Emission - New and Renewable Energy	MillionTon CO ₂ eq/Day	0.00054 [11]	Production Increase New and Renewable Energy Acceleration Rate
Gas Consumption	Standard Cubic Feet/Day	684,59 [10]	Gas Demand Rate*Gas Consumption
GHG Emission - Gas	MillionTon CO ₂ eq/Day	0.0022	GHG Emission - Gas *(Gas Production/365) ⁷ Gas Demand Increase Rate
Gas Price	US\$/ Million British Thermal Unit	6	Ministry of Energy and Mineral Resources Regulation No. 8 year 2020 [6] Price Floor Assumption
Carbon Market Price	US\$/ MillionTon CO ₂ eq	50,75[5]	

B. Strategic Plans to Address Future Scenario

Table 13 - STRATEGIC ENERGY PORTFOLIO OPTIMIZATION SCENARIOS

	Primary Stock		
Energy Portfolio Optimization Scenario	Low	Base	High
	US\$30/Barrel	US\$60/Barrel	US\$ 120/Barrel
Scenario 1	60% Oil 20% Gas 10% Refining and Petrochemical (Biofuel) 10% New and Renewables RRR Increase Rate +/- 5% Energy Efficiency Increase Rate +/- 2%/year		
Scenario 2	45% Oil 25% Gas 15% Refining and Petrochemical (Biofuel, Petrochemical Integration) 15% New and Renewables; (Technological Advancement of New and Renewable Energy) RRR Increase Rate +/- 10%/year Energy Efficiency Increase Rate +/- 3%/year		
Scenario 3	35% Oil 25% Gas 20% Refining and Petrochemical (Biofuel, Petrochemical Integration) 20% New and Renewables (Technological Advancement of New and Renewable Energy) RRR Increase Rate +/- 5%/year Energy Efficiency Increase Rate +/- 4%/year		
Scenario 4	25% Oil 25% Gas 25% Refining and Petrochemical (Biofuel, Petrochemical Integration) 25% New and Renewables (Technological Advancement of New and Renewable Energy e.g. Low Carbon-Fuels, Battery Storage Manufacturing) RRR Increase Rate +/- 20%/year Energy Efficiency Increase Rate +/- 5%/year Carbon Market Price Implementation +/= US\$50-75/tonCO2eq		

B. Strategic Plans to Address Future Scenario

Strategic plans to address future scenario according the simulations' analysis as follows:

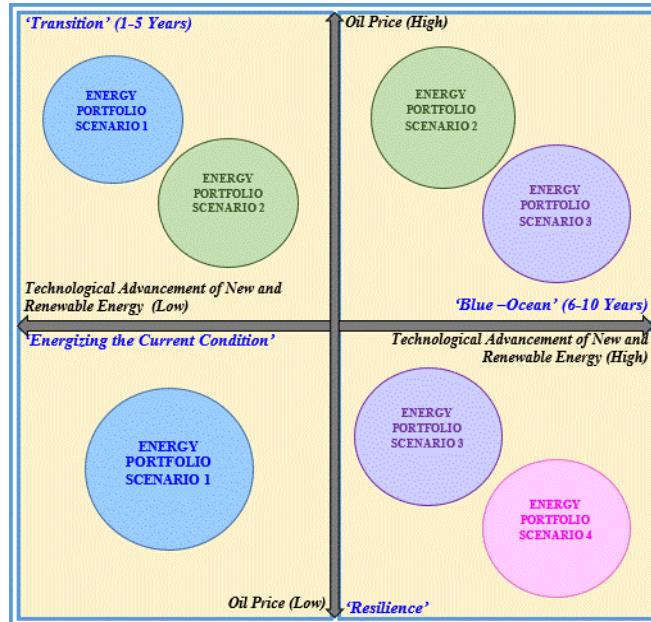


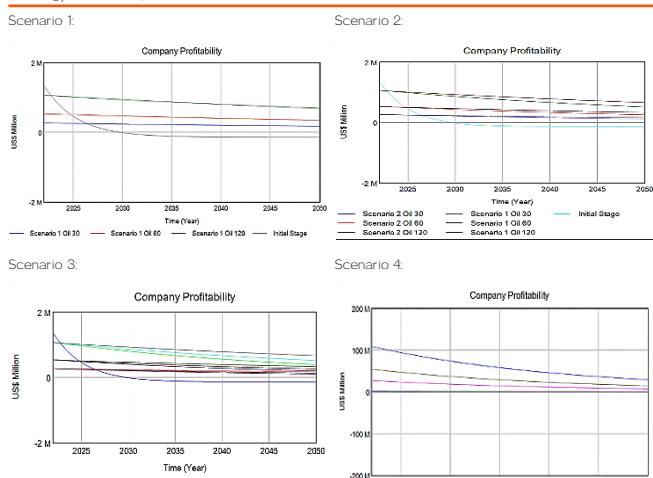
Fig. 8. Strategic Plans to Address Future Scenario

III. RESULTS

A. Strategic Energy Portfolio Optimization Scenario Simulation Results

Table 13 - STRATEGIC ENERGY PORTFOLIO OPTIMIZATION SCENARIOS

A. Energy Portfolio Optimization Scenario



C. Proposed Future Business Model

Future business model to address the strategic energy portfolio optimization scenarios:

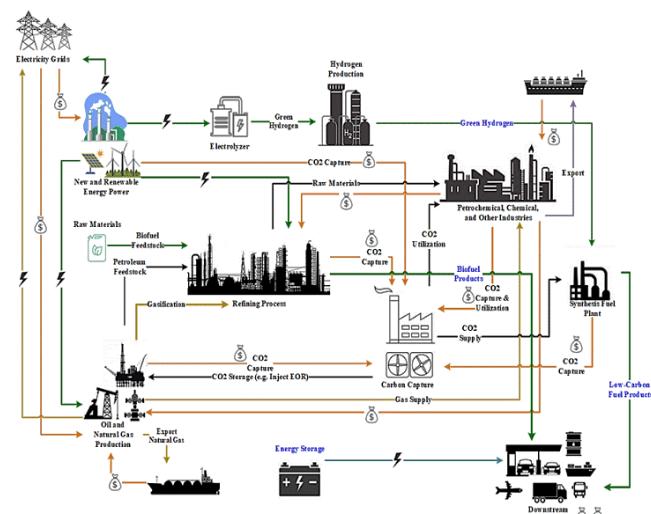


Fig. 9. Proposed Future Business Model

D. Early Warnings

Early warning signals, which are the leading indicators that highlight the likely emergence of one scenario to another to determine the adaptive strategy that the company should consider in the future, show that the company requires to evaluate the current corporate strategy as well as to accelerate the transition stage within 1-5 years from now.

IV. DISCUSSION

Since the scenario approach is not a one-time event, integration with the current business strategy is required to determine prioritization as well as the implication in terms of gaps, vulnerability, options or mitigation by embedding external risk factors in the current company's risk register, which expected to help the company identify the events beyond the company's control, particularly in facing the increasing uncertainties and to determine the climate change mitigation strategy in the implementation plan.

V. CONCLUSION

According to the scenario simulations and analysis, the conclusions found and recommendations as follows:

Strategic plans show that by gradually optimizing 10-25% of the company's new and renewable energy portfolio and integrating refining and petrochemical portfolio as a new revenue stream by building strong-integrated energy network from upstream to downstream to produce low-carbon fuels align with the implementation of circular carbon economy, e.g. carbon market price that expected to reach US\$50-75/tonCO₂eq will enhance the company profitability, in facing the uncertainty of oil price volatility, technological advancement and the declined cost of renewable energy, countries increasing commitment towards net-zero emission target, of Environmental, Social and Governance (ESG) global investment trend, and oil reserves structural declined projection in the long-run.

Common purpose as well as making smooth-transition both in the internal organization and government support are strongly required to achieve the company's strategic objectives.

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Paper 8

The Influence Of Environmental Awareness In Consumer
Towards Purchase Intention For Eco-Friendly Detergent
Products Of DET-URGENT

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - Environment is an aspect of life that is largely inseparable from how human beings cultivate and nurture their lives. However, recent events have perpetuated the damage taken by the environment around the world. One of which is Indonesia, where it is projected that the effect of damage suffered by its environment could increase the probability of natural disasters of every possible kind. Simultaneously, there is also a shift in lifestyle in how the people live their livelihood. There is a surge of green products and lifestyle trends in the world, Indonesia included. Several researchers have found the connection between the awareness of how susceptible the environment is to harm and the purchase intention of green products. Det-Urgent is a company that focuses on environmentally friendly products, more specifically detergents. The company utilizes the local resources of Belimbing Wuluh as well as Lerak fruits, where they mostly rely on local farmers as the main supplier for raw materials needs. For this reason, extensive market research is absolutely necessary, because currently limited studies that specifically divulge deeply about environmentally friendly detergents are quite limited. Det-Urgent has integrated environmental awareness in their marketing strategies and with this research would like to understand better if there is a profound relationship between environmental awareness and purchase intention towards eco-friendly friendly detergents. This research will delve deeply into the relationship between environmental awareness and purchase intention towards eco-friendly friendly detergent. The method that will be utilized is a quantitative method with survey as its main data collection instrument. Furthermore, the data that have been collected would then be analyzed using the multiple regression method. Regression method would then be used to deeply study the relationship between environmental awareness and purchase intention in potential customers. The variables that would be considered are as follows, purchase intention as the dependent variable whereas for the independent variables there would be environmental awareness, subjective norm, perceived behavior and finally attitude towards the product. This is because the basis of this research is the theory of planned behavior by Icek Ajzen. The minimum required of respondents for this research is a total of 105 people, where anything below that number is considered to be insufficient and unfit for data processing. Based on the survey, there are a total of 142 respondents that fulfilled the criteria that is needed for this research. The criteria that are applied

for this research is the respondents must have a prior experience of cleaning products or detergents and they must reside within Bandung, Surabaya and Gresik. From the data that had been collected and subsequently analyzed, it is determined that environmental awareness on its own does not affect purchase intention towards eco-friendly friendly detergents. Said variable must run through an attitude towards a product first, meaning its influence is an indirect one. It can be concluded that should Det-Urgent wanted to utilize environmental awareness in their marketing strategy, they need to make sure positive attitude towards the products is shaped so that it can subsequently increase the chances of purchasing intention from potential customers.

Keywords - Business;EnvironmentalAwareness;Purchase Intention

I. INTRODUCTION

The advancement of how human beings proceed with their living does not only convey positive impacts towards their livelihood but is also accompanied by overall deterioration of the environment itself (Debjit Dahal & Amrit Pal Singh, 2020) This is due to most rapid development of growth in human development necessitates the use of natural resources, which therefore could lead to unwanted repercussions (Y.-S. Chen, Huang, Wang, & Chen, 2020; B. Kumar, Manrai, & Manrai, 2017; Haiyan Li 2020) Series of damages that range from serious pollution, harm to the ozone layer and greenhouse gasses plagued the earth and is affecting most industrialized nations on earth (Debjit Dahal & Amrit Pal Singh, 2020) This continued harm to the environment that is the pillar that supports billions of people's well being could cause significant degradation in their quality of life (Corey J. A. Bradshaw, Xingli Giam & Navjot S. Sodhi, 2010)

In Indonesia for instance, hazards to the environment are projected to affect various sectors. One of the most extreme examples is Indonesia, which is already more susceptible to drought and forest fires, and would be expected to experience a higher intensity of those two calamities as the after effect of prolonged environmental damage. On the other hand, the estimated risk of coastal flooding could escalate into 19–37% by 2030, and as the majority of its people live in low elevation coastal areas, this could detrimentally affect a lot of people. Climate modeling also explained that water scarcity is a problem

that would be exacerbated in the future, as even in 2010, it is reported that 14% of Indonesia's 453 districts had no surplus water, and this would worsen into 20% by 2030 and 31% in 2050. These are only a fraction of what extended environmental damage could cause to the livelihood of humanity (World Bank Group & Asian Development Bank, 2021).

This has led to the birth of a way that could minimize environmental harm by shifting one's own lifestyle into a more sustainable way. A person could lessen the damage to the environment through their purchasing decision (Xiaoyun Zhang & Feng Dong, 2020). The aforementioned development of such behavior has caused a significant demand on products that create less damage to the environment (Soyez, 2012 ; Thøgersen, de Barcellos, Perin, & Zhou, 2015 ; Haiyan Li, 2020). In other words, products that encompass characteristics such as non-damaging to the environment, in both its creation and usability, are commonly known as "Green Products" (Tan Booi Chen & Lau Teck Chai, 2010).

The trends of green products have been wide-spread on different types of sectors, such as food, electronics, cosmetics and other products that support the daily lives of a human being (Qi Zhang, QiuHong Zhao, Xuan Zhao & Ling Tang, 2020). For example, in a survey conducted by WWF Indonesia and Nielsen Company, apparently at least 63% of Indonesians would be willing to pay for products that are safe to the environment (WWF Indonesia, 2017). In addition to that, based on a research overseen by Hakuhodo Institute of Life and Living Asean (HILL Asean), 86% of Indonesians are already practicing a more environmentally conscious lifestyle, with around of 74% of citizen in Indonesia have a better inclination towards brands that are more environmentally responsible (Yasmin, 2020).

To be more specific, this phenomenon showcased by consumers is a form of purchase intention. This becomes extremely important because the intention of a consumer itself could be used to predict specific manners of actions they would undertake regarding a product or service. In addition to that, motivational factors are also important in what course of action a person would take in regards to their purchasing intention (Ajzen, 1991; Morwitz, 2012; Nathalie Pe-na-García , 2020). From this notion, there might be a link between environmental awareness towards the surge of environmentally responsible lifestyle in Indonesia.

Environmental issues as a whole alongside its effect, has become a main force of individuals and organizations to seek mitigation plans to protect and improve the environment (Ishaswini, 2011). There have been reports that showcase heightened public interest in sustainability and environmental issues in general, in which the majority

of people currently are conscious of making choices that would ensure the stability of the environment (IPCC, 2014; UNEP, 2015; The Ninh Nguyen, Antonio Lobo, & Steven Greenland, 2016).

The ability to understand how susceptible our environment is to harm caused by human activities and therefore proceeding to take part in environmental related activities in order to protect it is called "Environmental Awareness" (Xinsheng Liu, 2014; Marie Louise Umuhire & Qinhua Fang, 2015; Meng-Meng Geng & Ling-Yun He, 2021; Mohd Khairul Amri Kamarudin, Muhammad Hafiz Md Saad & Noorjima Abd Wahab, 2018). In Indonesia, for example, where its government has decreed a roadmap for future stability and growth of the environment which incorporates all policies, planning, and investments necessary to encourage the protection of the country's own environment. The existence of this roadmap called, "Delivering Green Growth for a Prosperous Indonesia" in which it is brimmed with endeavors of creating a better environment of Indonesia is a proof that, the country and its people are aware of how human actions is pivotal and feels the need to take some initiatives (Government of Indonesia, 2015). A research conducted by Statista Research Department in 2019 also shows around 82% of Indonesians stated that they felt the environment is a crucial part of their lives, a majority of them are already alert in terms of how important the environment is (Statista, 2021). One of the real-life manifestations of this awareness is an effort to shift one's own lifestyle into something that would be more advantageous to the environment. In the roadmap mentioned above, there is one program named "The Sustainable Consumption and Production Program"; it is spearheaded by the Ministry of Forestry and Environment as well as Bappenas themselves. The aim of this program is to embed and integrate green products usage as much as possible in Indonesia, where they are also prepared to increase the understanding of green products, in the hope of encouraging behavioral change of Indonesians (Government of Indonesia, 2015).

This change of lifestyle preference all the world, and that includes in Indonesia, is not without reason, as it is mentioned in the previous studies that it is expected when one's own awareness towards environmental issues increases, so does the desire for environmentally friendly products (De Moura et al., 2012; Justin Paul, 2015). There have been several researchers that investigate this particular topic, where the relationship between environmental awareness and purchase intention is being studied in great detail (Okada & Tamaki, 2019; Haiyan Li, 2020; Widodo & Yusiana, 2020; Lestari E, Septifani R & Nisak K, 2021) however, none of those previous studies had emphasized specifically on the purchase intention that relates to eco-friendly detergent with Belimbing Wuluh as a base in Indonesia.

In other words, the research only makes general statements about green items; not a single product was singled out. In addition, a study conducted in Japan examined the impact of awareness on consumers' intentions to purchase electric automobiles (Okada & Tamaki, 2019). Furthermore, in other Asian countries such as India, a similar study was conducted, however the scope of this study is too broad, because it does not specify what kind of green products are being analyzed (Kumar, 2012). One of the studies conducted in Indonesia itself examines how customers behave towards green products there. Despite this, the study simply examines green products as a whole without mentioning the individual products that are under investigation (Eles & Sihombing, 2017). This study intends to explore in considerable detail how environmental awareness and buying intention connect to the use of environmentally friendly detergents. The results of this research would also be employed further for Det-Urgent to enhance their company strategy.

II. METHODOLOGY

This particular research would first begin by analyzing and interpreting problems Det-Urgent has as a company, where the most integral as well as important predicament would be addressed by the researcher. After that, literature review is going to be commenced in order to find comprehensible theories that are aligned with the main topic of this research.

The researcher would then subsequently form a conceptual framework as well as hypothetical structure that could yield answers to the proposed research questions. Then, a questionnaire that is suitable for the research questions would be disseminated so that it could collect data from appropriate samples that have been previously determined. Data that have been collected would then be analyzed in order to gain insights about the research questions and to prove the hypothetical questions of the researcher. Finally conclusion would be with the result from data analysis as a base where then recommendations to the Det-Urgent business and further research could be proposed.

4.2 Research Methodology

In this particular research the main approach that will be used is deductive approach which is concerned with developing hypotheses based on existing theory and the research design was developed to test the hypothesis. Furthermore, a quantitative approach is implemented due to the nature of this particular research that relies heavily on numerical data obtained from a survey (Ahmad & Wasim, 2019).

A cross sectional survey is adopted as a research strategy to answer and find evidence to test the hypothesis. The study only used one method which is survey or questionnaire as a method and will be explained in detail in the following subchapter. A survey is utilized due to its ability to compile a large data set that includes characteristics as well as opinions from a relatively large group of people (Pinsonneault & Kraemer, 1993; Priscilla A. Glasow, 2005). On the other hand, the versatility of a survey is a huge factor when it comes to the current pandemic situation, even if overall the intensity of COVID-19 has dwindled down, acquiring data through survey is considered to be the better option. The data gathered from the survey will revolve around respondents' degree of environmental awareness and how it would affect their purchase intention towards Det-Urgent's product.

4.3 Data Collection

In the case of this particular study the primary data that will be collected would originate from questionnaire results. The reason behind this is that questionnaires are quite effective when researchers plan to gather data from different areas with little difficulties. On top of that, data obtained from it would provide little bias as well as unwanted answers. Questionnaire would then yield clear and coherent quantitative data that is of great importance to the research (S. Roopa & MS. Rani, 2012). Primary data is data that has been retrieved by a researcher of a study by first hand methods. Moreover, primary data is highly integral to this research, as the information obtained would be authentic and with little to no tampering from previous study (Kabir, 2016).

The questionnaire that would be disseminated to the respondents would be thoroughly planned and structured, in order to achieve reliable as well as insightful data. In addition to that, to make the data more accurate, the researcher of this study would implement Likert scale for the questionnaire. This is due to the fact that Likert scale is commonly used to measure attitudes that are embedded in respondents, where they could express their agreement or disagreement in a metric scale (Ankur Joshi & Dinesh Kumar Pal, 2015). In the questionnaire measurement, a five-point Likert scale would be used, as an odd number scale is proven to be better and reliable. Furthermore, a five-point Likert scale is able to ease the respondents into participating in the survey and therefore increasing response rate (James T. Croasmun & Lee Ostrom, 2011).

4.3.1 Population

In this research, the population is the main target of interest that would be studied and is already determined since the beginning (Umair Majid, 2018). To be more specific,

all individuals, both females as well as males who have bought detergent or cleaning products and are currently residing in Gresik, Surabaya and Bandung. The underlying reason behind this decision is that those areas are where Det-Urgent primarily markets their products. In addition to that, the respondents must have at least an experience in terms of using cleaning products, more specifically detergents. In terms of respondents, this research would require a minimum of 105 respondents in order to obtain reliable data to analyze, based on Hair and Black (1992).

4.3.2 Sampling Techniques

Sampling is the means and process of determining the representative of the population, more specifically named sample. In other words, sampling is used to select which sample would be analyzed and studied in a research. A non-probability sampling method will be applied in this research. The reasoning behind this is that that particular method could be utilized to generate novel insights as well as to study existing theories or even emerge brand new theories into existence (Showkat & Parveen, 2017).

There are several types regarding non-probability sampling methods, however in this research, the one that would be embedded is convenience sampling. This is due to the degree of liberty convenience sampling could provide to this specific research. It is also highly favorable in which little budget and mobility is required to do convenience sampling, where the researcher is given the freedom to use acquaintances as part of the sampling (Taheerdoost, 2016).

4.4 Data Quality Assessment

The researcher would use a pilot test in this study in order to identify whether the instrument of research in the form of a questionnaire is already suitable or not. Pilot test is commonly used to determine design flaws existing in the research instrument. In addition to that conducting a pilot test would also reveal what might encumber the participants before delving further into the study. By using this method, researchers are able to improve or omit design flaws that might hamper the continuity of the study (Fraser, Fahlman & Guillot, 2018).

4.4.1 Validity Test

Validity testing is utilized to elaborate how well the data obtained can cover the topic of interest or area of investigation. Variables are considered to be valid if their Standardized Loading factors have a score of ≥ 0.05 or if they have a R-Value that is greater than the R-Table.

4.4.2 Reliability Test

Reliability testing is related to how consistent the measuring instruments are. It is commonly tested by using the Cronbach-alpha coefficient. Reliability that variables have must be equal or above 0.6 to be considered valid.

4.5 Data Analysis Method

Regression analysis is a statistical method of analyzing the relationship between existing variables, both dependent and independent. In this research, there is only one dependent variable whereas there are several independent variables, meaning that the most suitable regression method is the multilinear regression. The equation from this statistical method would then represent the linear relationship between the dependent variable and independent variables (Uyanik & Guler, 2013). The data gathered in this research will be analyzed through this particular statistical method, and provide insights to whether environmental awareness does have a positive relationship in customers' purchase intention.

4.5.1 Classical Assumption Test

Before proceeding with the multiple linear regression, there must be a classical assumption test that should be done, in order to ensure that the model is free from any slight deviations that might tamper with the data. The classical assumption test would consist of multicollinearity test, heteroscedasticity test, autocorrelation test, normality test, and linearity test.

1. Multicollinearity test

This test is utilized to determine whether there is a high correlation between independent variables. Should there be a correlation between those variables would then result in a disruption for the connection to the dependent variable.

2. Heteroscedasticity test

Heteroscedasticity means that there is a residual variance that is not constant. A good regression model occurs when there is not any heteroscedasticity present, meaning that a good model should be homoscedastic. This can be detected when scatterplots of standardized residual regression of the distributed standardized predicted values have no distinguished pattern. On top of that homoscedasticity could also be recognized if residual significant values is > 0.05 .

3. Normality Test

Normality test is implemented in order to determine if a data is normally distributed. A normal distribution, showcased by a bell shaped curve, means that it fully represents the population. A normally distributed data

would have a significant value of > 0.05 in the Kolmogorov-Smirnov.

4. Autocorrelation Test

This test is used to oversee if there are any linear relations in the errors of a time-series observations. Autocorrelations must be done should a time-series data is present, and the test is assessed through the Durbin-Watson method.

5. Linearity Test

This test should be utilized in order to determine whether there is a linear relationship between the dependent and independent variables. Linearity tests could be observed by looking at the Sig. Deviation, if the value is < 0.05 then, the variables have a linear relationship, whereas if the value of Sig. Deviation from linearity is > 0.05 , then the linearity is significant.

4.5.2 Multiple Linear Regression

The multiple linear regression that would be utilized for this particular research could be formulated as follows

$$Y_i = (\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_n X_{in}) + \epsilon_i$$

Y : Dependent Variable

β_0 : Constant

β_n : Regression Coefficient

X_n : Independent Variable

ϵ : Error

After conducting thorough regression analysis, the final result could then be represented using SPSS, more specifically by for the model fit evaluation, R2 or coefficient and determination would be utilized through the summary table. As for the F-ratio assessment, ANOVA table could be employed for that specific task. In addition to that, for the multiple regression formulation evaluation, coefficient table is the suitable fit to do that for the variables that have been tested.

III. RESULTS

A. Expected Result

There have been several researchers that investigate this particular topic, where the relationship between environmental awareness and purchase intention is being studied in great detail (Okada & Tamaki, 2019; Haiyan Li, 2020; Widodo & Yusiana, 2020; Lestari E, Septifani R & Nisak K, 2021) however, none of those previous studies

had emphasized specifically on the purchase intention that relates to eco-friendly detergent with Belimbing Wuluh as a base in Indonesia.

In this research it is expected that there would be a positive relationship between the intention of purchase for eco-friendly laundry detergent and environmental awareness.

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Paper 9

What Makes a Video Viral? The Analysis of Viral Video Attributes Towards Video Marketing in Indonesia's Health and Beauty Industry

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ICMEM

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Abstract - Viral video marketing on Instagram is the future of business as it is a way to do effective and efficient marketing. Nowadays, brands create videos but are unaware of what enables their videos to attract exponential engagement than comparable image content. Some scholars studied the attributes of viral videos, yet none was conducted specifically for viral video marketing using Instagram platform in the health and beauty industry amongst Indonesian. In this paper, researcher aim to identify the significant attributes influencing content in the health and beauty industry and give recommendations to create viral videos for businesses in the respective industry. Using the PLS-SEM, this study investigates the relationship of viral attributes researched by five scholars towards video virality. The research focus is on Indonesian aged 19 to 30 who use Instagram daily and follow 1 account in the respective industry. A total of 104 respondents were chosen. This study was done quantitatively using an online questionnaire. Researcher found elements of laughter in video common elements and novelty impacts significantly in a positive way.

Keywords - Health and Beauty Industry, Instagram, Video Marketing, Viral Attributes, Virality

I. INTRODUCTION

Viral marketing is extremely attractive to start-up ventures with a limited marketing budget, since it costs very little but still delivers astounding results in a very short period (Bhattacharya, 2018). Viral marketing exploits existing social networks by encouraging customers to share product information with their friends (Leskovec, Adamic, & Huberman, 2008). The information types drawing better advertising attention that impacts virality, from the strongest to the weakest were in this order: Video-based > Picture-based > Text-picture mixed > Text-based (Yu-Chen Hsieh , Kuo-Hsiang Chen, 2011).

Indonesian netizens tend to learn about product information from social media and share the information to their online friends and followers (Kusumasondjaja, 2018). The social media platform to reach most people amongst Indonesians is Instagram. Instagram video content is currently available in four formats: Live, Stories, Instagram Video, and Reels. But does every industry fit using Instagram Reels?

Seeing the trend has shifted from just static photos to

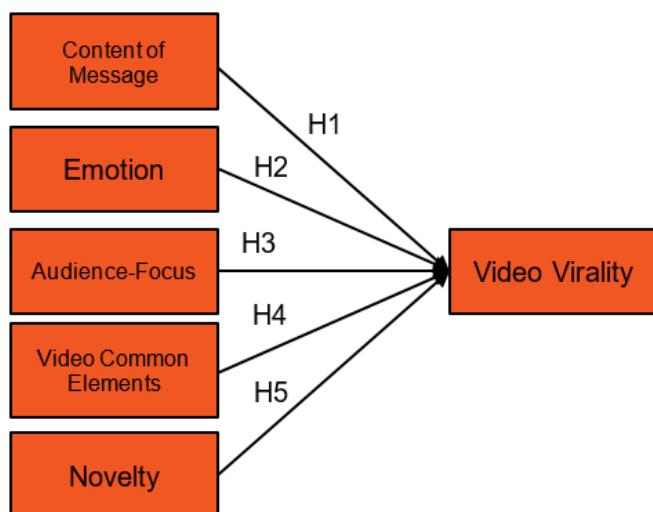
videos, developing startups wants to try making more video content marketing. As of now, developing startups can already create videos, but they are not aware of what makes previous videos considered good and can prove a study by Databox (2021) that found video ads attract three times more engagement than sponsored images on Instagram. By adding viral attributes in video content, developing startups can enhance the possibility of the post to perform well and meet its objectives to reach awareness and increase branding.

II. METHODOLOGY

Researcher uses five variables, respectively content of the message (Maria Woerndl, Savvas Papagiannidis, Michael Bourlakis and Feng Li (2008) emotion (Jonah Berger and Milkman (2012), audience-focus (Holliman and Rowley (2014), novelty (Hyun Suk Kim (2015) and video common elements (Tyler West (2011). Based on the researcher's preliminary research, the attributes were selected. The researcher selected Bourlakis and Feng Li's (2008) study, which assessed the message's content as a factor determining virality on the YouTube platform with its target in the entertainment, food and beverage, and fashion industries. The article was chosen based on preliminary research showing that 68 percent of respondents agree that captivating material has an impact on virality. Research also used Berger and Milkman (2012) who contend that when the subject is a New York Times piece, emotion influences virality in general industry. This article was chosen based on preliminary research showing that positive videos had a higher chance of becoming viral (63%) than negative ones. The third article selected is Holliman and Rowley (2014) which, based on their interviews with social media managers of businesses with headquarters in the UK, USA, and France in broad industries, verified audience-focus as a factor determining virality. The selection was appropriate because it was based on preliminary research, of which 42% indicated that relevant and helpful content in videos can increase their likelihood of becoming viral. Runtime, sound selection, and Tyler West's element of laughing make up the fourth variable, along with its derivatives (2011). The best 50 YouTube viral videos of all time, as listed by Time Magazine, are evaluated in this essay. As 26% of respondents think that the length of the video and the audio used have an impact on virality, it was chosen. Finally, novelty is selected as the fifth criteria because 26% of participants in the preliminary study concur. This

is supported by research conducted in 2015 by Hyun Suk Kim using New York Times Health News items.

Researchers discovered that there is still a gap in the studies carried out by earlier experts. Particularly in regards to their non-Indonesian object or target respondents. The Instagram application or the health and beauty sector were not particularly tested in the pertinent study that is currently accessible. Consequently, there is still a chance for the researcher to carry out this study. Figure 2.1 below demonstrates the conceptual framework:



To test the hypothesis of this research, a quantitative method was used with a survey as a tool to collect the data. Research uses purposive non-probability sampling towards target respondents. This method differentiates with the previous research to study virality (Berger and Milkman, 2012 and Holliman and Rowley, 2014) Berger and Milkman used a large-scale quantitative method using a sample of a unique data set of all the New York Times articles published over a three-month period, while Holliman and Rowley used a Semi-structured interviews with 15 key informants involved in B2B content marketing in the USA, UK and France, in five industry sectors. But researcher want to validate directly using a perspective from general viewers itself about what makes them share a video thus affecting virality. Researcher have conducted a preliminary research and found that the answers were similar to previous literature. There might be a modification or difference in the response due to the perspective change.

The research conducted in this study is limited to respondents with the characteristics of Indonesian domiciled in Bandung that are 18-30 years old that uses Instagram minimum 7 days per week each and follows at least 1 account in the health and or beauty industry in Instagram. This study used a non-probability sampling strategy with self-administered questionnaires within 18

July until 25 July 2022 and limited online data collection due to the COVID-19 pandemic. Thus, this research has several outcome limitations.

III. RESULTS

The majority of respondents' age is from 20 years old, representing 35.7% and 76.9% of them are female while 93.3% are college students. When asked to mention 1 account they follow and saw using video marketing, the answers for health industry accounts are not as variative as beauty industry. As for respondents' interest and knowledge, the majority of them knows and mentions 'Citayam' when asked to mention a viral video they last saw.

According to reliability test results using PLS SEM, six of the variables are deemed reliable with Cronbach Alpha values >0.6 , all factor loading values >0.7 , and all AVE values >0.5 , demonstrating the validity of all indicators and variables (Malhotra, 2016; Ab Hamid et al., 2017). The Fornell Larcker Criterion and Cross Loading computation show that there is a stronger correlation between an indicator's value and its dependent variable when calculating cross loadings, thus the data is regarded as reliable. The variables are tested to not have multicollinearity because all values are less than 5.

Overall, independent variables contribute 31.8% to virality as dependent variables and the goodness of fit value is 0.279 (>0.1) which indicates that the proposed model can explain the findings. From table 3.1 we can see the bootstrapping result that shows variables significance and influence direction towards virality.

	Original Sample	T Statistics (O/STDEV)	P Values
AF->VI	-0.065	0.66	0.51
CE -> VI	0.385	3.589	0.0
CM -> VI	0.021	0.196	0.845
EM -> VI	-0.071	0.654	0.514
NO -> VI	0.38	4.181	0

Video common elements (CE), content of the message (CM) and novelty (NO) have a positive relationship towards virality (VI). While two variables have negative relationships towards virality, which are audience focus (AF) and emotion (EM). Researcher found that content of the message, emotion, and audience-focus have a nonsignificant relationship with virality. In turn, video common elements and novelty have a significant positive relationship towards virality.

IV. DISCUSSION

What is interesting in this study, Content of the Message, Emotion, Audience Focus, which were proven by several scholars, do not have a significant relationship with virality in the context of Instagram platform and in the health and beauty industry. Researcher notes a few lessons that influence the matter.

First is how Virality as a single item variable might not represent the variable as a whole, especially when it is the dependent variable measured. The item 'The video stays for a long time' in the virality variable had the fourth lowest mean compared to all other items in the questionnaire and might not be fit for the real situation in the field where nowadays many viral topics are not a trend but a fad, where content are very popular only for a short time.

The framework also differs from conventional studies where when researcher ask directly to a target respondent instead of analyzing dozens of videos crawled from the internet. This is due to researcher time and budget constraints. Asking viral attributes directly to the audience or consumer was not commonly used by previous research. The framework used in this study is also a combination of five different authors and none in the same platform as research studies. There are differences in how the audience, or the algorithm work in different platforms.

This research captures a narrow range of respondents characteristics. This is shown by how the majority of the respondents show a similar background, knowledge, and interest. The majority of respondents mention the same beauty brands and examples of viral videos. Other than that, more respondents have better knowledge in beauty than the health industry, shown by the accounts mentioned are mostly skewed to beauty accounts. The health account answered is dominated by only two competing health platforms.

Some questions were not established well and could have multiple interpretations. For example those with time-measurements such as 'fast', 'long time', 'short duration'. There were also questions that could be biased for the respondents, they are the ones who researcher give examples of.

Content of the message shows an insignificant value on virality. Content of the message includes how the video is fun and intriguing, and is easy to use. In previous research by Woerndl et al. (2008), researchers analyzed ads videos from YouTube. The change of behavior between the two platforms are significant enough to say differences could happen. Then this discovery can also mean that for a video to be viral, content of the message is not so important.

Likewise, emotion shows an insignificant relationship to virality. Emotion has four indicators which are emotionality, anger, anxiety, and sadness. The research conducted by Berger and Milkman (2012) studied the New York Times Article generally and concluded that positive content is more viral than negative content. It can be seen in the descriptive statistics too that anger, anxiety, and sadness were the top three items with the lowest mean. The finding concludes that less virality is to be expected with negative emotions, although it is not significant.

Audience-focus does not significantly influence video virality. The study results are not in line with previous research that audience-focus content can further create virality (Holliman and Rowley, 2014). The researcher decided to gain more information. Analyzing the results from questionnaires strengthens the findings that a video does not have to be useful to the audience, more are asking for unusual and funny content. Many times, information is not packed in an unusual way that makes the audience bored when watching. Therefore, to create videos that are more likely to be viral, relevance and usefulness in a video needs to be supported by other variables.

Video common elements variable is the second most significant factor that positively affects virality. This is a single construct variable and consists of 'Elements of Laughter'. The findings are aligned with preliminary research that says funny videos are more likely to be viral. But it differs with the previous study from Tyler West (2011) where it had 70% analyzed videos with no element of laughter. The finding implies that when targeting a profile similar to this study respondents, humor included in the video is prominent.

Novelty variable is the most significant factor that positively affects virality. The findings are in line with preliminary research and behavioral questions in questionnaires distributed that unusual content that makes the audience interested are perceived to affect virality. This also describes the viral topic which is Citayam that was mentioned by the majority of respondents. The unusuality of the fashion is not in the design but in how they mix and match the items. SCBD also got a new name, from 'Sudirman Central Business District' to 'Sudirman, Citayam, Bojong Gede, dan Depok'. This shows that audiences like newness even if they are in detail matters.

V. CONCLUSION

Prior study has been inconclusive as to how video marketing may be improved to create virality. As a result, the researcher develops a conceptual approach to viral video attributes to encourage virality. This study creates a research framework to investigate the relationship between viral attributes toward virality based on direct viewer's perception.

One of the objectives of this study is to identify the influence of the video attributes towards virality. The researcher used three indicators of content of the message that were previously used by Woerndl et al. (2008) and four indicators of emotion that were previously used by Berger and Milkman (2012). The data was collected through an online questionnaire and filled by 104 respondents domiciled in Bandung that are aged between 18-30 years old, is active daily on Instagram, and follows at least one account in the health and beauty industry. The results of this objective indicate that video attributes can directly influence virality. The variables significantly influencing virality are video common elements and novelty. The variables tested affect 31.8% towards virality so there are 68.2% other variables affecting virality.

And last, this research wants to give recommendations specifically to businesses owners that are engaged in the health and beauty industry when they're implementing video marketing as a strategy. The result shows that elements of laughter and unusuality have a positive influence toward virality directly, meaning that if a business owner wants to increase the chance of virality in their videos, they need to increase the element of laughter and novelty. As a result, in order to create more viral videos steadily, business owners must design a video concept that is new, unusual, and surprising content.

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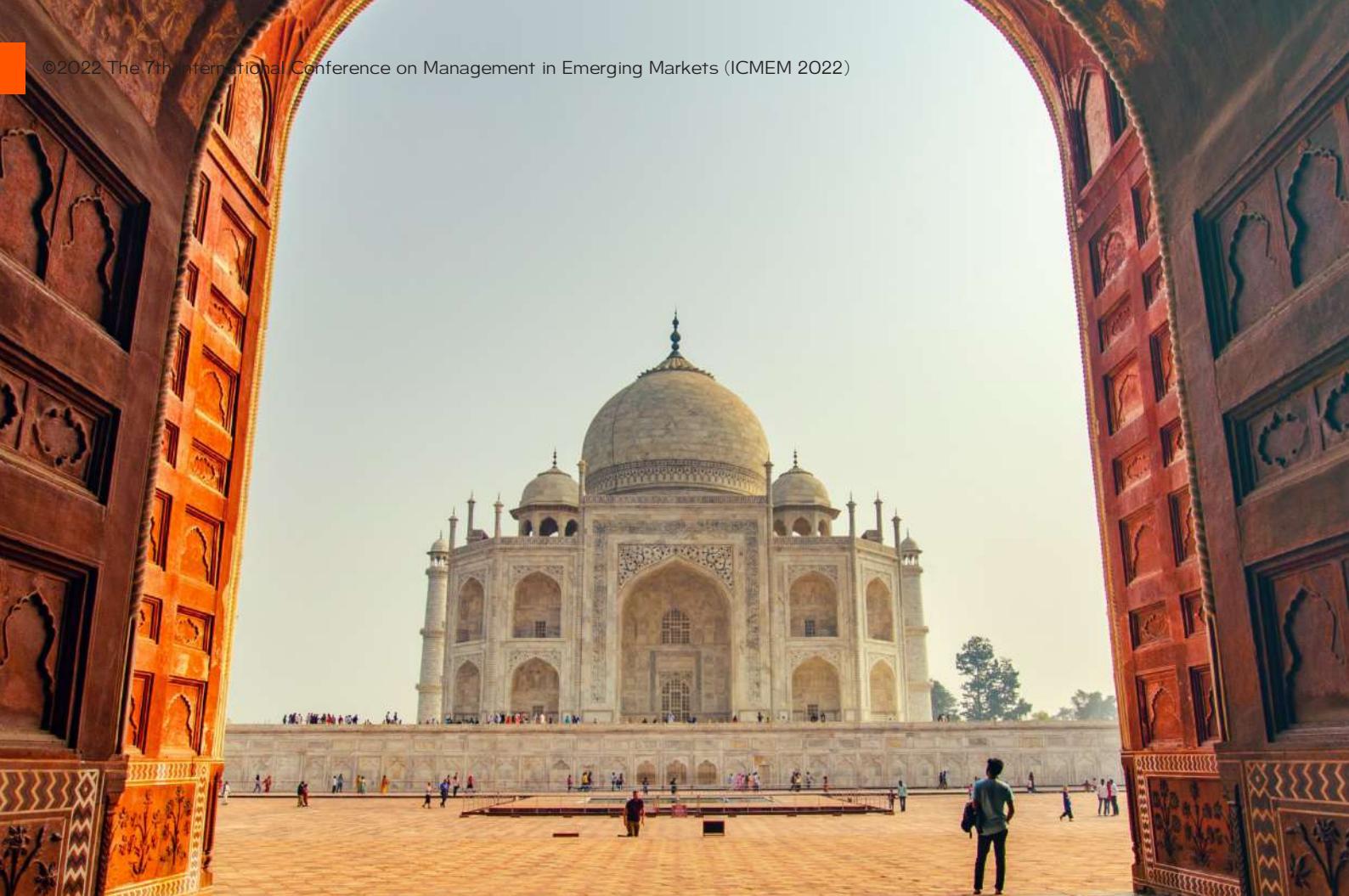
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Paper 10

Empirical Study on Understanding the Ethical Behaviour
of Fair and Lovely Marketing Communication in Targeting
Indian Audiences

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Abstract - This research paper focuses on the empirical study used to examine Indian audiences' perspective on the marketing communication of Fair and Lovely. The brand's advertisement lies upon the promotion of beauty ideals constructed on racial standards, the discriminatory sexist stereotypes, and prejudices related to skin colour. Therefore, the question on whether ethical approaches are adopted or if it is dismissed, alongside the impact that it has created for the Indian audiences. A qualitative research method was adopted, hence involving 10 Indian participants through a semi-structured interview. Findings of this research study shows that unethical practices are conducted, these are detected through; brand's false advertisement, false perception, lack of inclusive brand ambassadors, and the shortfall of diverse and inclusive marketing communication of Fair and Lovely. According to the research's conclusions, unethical business practices are linked to India's past history. In recommendations of this research study for Fair and Lovely to have a positive response marketing using appropriate messaging terms, such as promoting healthy skin rather than fair skin will give out a positive delivery of beauty to the Indian audiences.

Keywords - Advertisements, Fair and Lovely, Indian audiences, marketing, marketing communication, racial discrimination, unethical practices

I. INTRODUCTION

Women are continually reminded of what they believe defines beauty. In which, the marketing outlet has contributed to the false perception of beauty by defining beauty as one certain look, the Eurocentric look (Mayorova and Kwan, 2003). Series of advertising continues to convey the blatant message that dark skin is a barrier to women's better work options, and that using skin whitening products may lighten the complexion and thereby transform lives (Karnani, 2007). Thus, riling up critics from groups of women towards the advertisements as 'discriminatory of skin colour on daily basis', 'a disrespect of women's dignity', and 'very racist' (Lestikow, 2003).

Hence, India which is believed to be one of the most diverse countries in the world (Wang and McLean, 2016), as multiples of religion, gender, education, ethnicity, languages, class, social orientation, and generation all come together in this nation. Nevertheless, the battle of

diversity in India has become a challenging issue. Wang and McLean (2016) article mentioned six challenges connected to organisational diversity, one of which is: racism based on skin colour (Sims and Hirudayaraj,

2016). As mentioned by Sims and Hirudayaraj (2016) in their article, many Asian societies revere light or white complexion as a symbol of status and power, and colourism impacts both men and women's self-perceptions. Suggesting the superiority of colourism and anti-blackness.

This research focuses on the iconic brand Fair & Lovely which reportedly has 70% of India's skin-lightening market shares (Gajanan, 2020). Following significant criticism that it promotes beauty ideals based on racial standards, Unilever and its Indian affiliate, Hindustan Unilever Limited, revealed that by last year intentions to rebrand its best-selling skin whitening product, Fair & Lovely (Gajanan, 2020). Taking into account this phenomenon, I see the urgency to further explore and understand the marketing practice of Fair and Lovely, and assess whether an ethical approach is apparent in the advertisement for the Indian audiences. Thus, this research aspires to achieve the following research objectives:

- o To assess the ethical positioning based on the Indian audiences for Fair & Lovely
- o To observe how the Indian audiences perceive Fair & Lovely marketing activity
- o To explore the Indian audiences level of responsiveness towards Fair & Lovely
- o To understand whether Fair & Lovely has affected the Indian audiences positively or negatively

Moreover, this research will conduct an empirical study from the Indian market. Emphasising on the brand Fair and Lovely the research aims to discover whether the brand has deprived ethical marketing to be depicted for the market or not. Therefore, the research question obtained is;

- o How has Fair and Lovely communicated their ethical practice through marketing its product to the Indian audiences?

II. METHODOLOGY

The philosophical methodology which will be adopted for this research study is interpretivism. The stance taken by interpretive research methodologies is that our understanding of reality is a social fabrication by human interactions (Walsham, 1995). According to this viewpoint, the researcher interacts with the human subjects of the inquiry, affecting both side's perceptions (Walsham, 1995). Hence, this is a contrast to positivism which also is a philosophical methodology, that assumes the researcher's 'objective' data can be used to test prior hypotheses or theories, while interpretivism relates with how each tackles the study through exploring and examining human behaviour. Moreover, interpretivism allows a more flexible and wider approach that could be constructed in the research study. Finally, based on the research study it allows the interpretation of Indian audiences of Fair and Lovely perception on the marketing communication which has been depicted by the brand.

In addition, the theory development inductive method is used in this research study. Inductive method allows the researchers to better grasp the relationship between the causes and the effect of the research study (Yom, 2014). The strategies of exploration on specific searches and more direct methods that are being studied. Additionally, during the study process, researchers will be encouraged to ask how the data which are collected, matched the proposed explanation, with the goal of acquiring a better understanding of observed events (Robinson, 1951). Thus, for this research study, the method of detecting the patterns, forming preliminary hypotheses allows a more exploration of the topic that could be conducted, and allows a more tentative conclusion. Finally, the data collected on the understanding of the brand Fair and Lovely marketing in targeting Indian audiences can be further generalised for conclusion.

In this research paper a qualitative approach will be conducted. Qualitative research gives out a general term that refers to study that emphasises the human experience through exploring opinions, beliefs, values, and experiences (Whitehead, 2007). Hence, through the phenomenological approach of this research paper, seeking to comprehend the significance of events and human interactions is fundamental. Gathering more information and acquiring a better understanding of what data is relevant is acquired, encouraging a more flexible approach that is so important to the qualitative research paper, in which it can change a line of research and move in new directions. Therefore, through the exploratory approach in understanding the brand Fair and Lovely marketing communication for the Indian audiences gaining richer data could be obtained through qualitative research.

Qualitative researchers must strike a balance between the requirement to be brief and the need to preserve their data's richness (Polit & Beck, 2010). Therefore, as this research study follows a qualitative approach it is most suitable to use the NVivo software, which are usually used for researchers that are obtaining qualitative methods for their research study. Through NVivo the data which are collected are analysed by thematic analysis. Thematic analysis enables pattern dictation within the data, thus emerging themes become the categories for investigations (Fereday & Muir-Cochrane, 2006).

Data collection will be utilised as a support for the literature review. As the methodology and the analytical strategy used by the researchers influence how the data is used and what findings it can generate (Paradis, O'Brien, Nimmon, Bandiera & Martimianakis, 2016). Therefore, for this research study the data collection method will be interview.

a. Interview:

In this research study semi-structured interviews will be carried out, which takes place in April 2022. Semi-structured interviews provide a structure for the researchers to ask the relevant open-ended questions to enable participants to speak freely about their experiences (Polit & Beck, 2010). The use of open-ended questions are utilised as researchers want participants to elaborate in their own words and point of view, this allows for the collection of deeper and more complicated data (Whittemore & Grey, 2006). Additionally, each interview is set out uniquely, and the quality of the responses acquired from different interviews may vary greatly, the interaction between the interviewer and participant may vary in ways as well (Kumar, 2005). Thus, allowing freedom for the participants to answer the questions the way they desired, along with variation of the way in which each question is asked could happen.

Moreover, five out of ten participants were connection of the researcher; while the other five were recruited by third parties who were also known to the researcher. All the participants were contacted through an instant messaging platform by the researcher, and carried out the discussion on the preferable time for the interview. In addition, prior to conducting the interview, a consent form will be sent out to each participant and agreed upon participating in the research study. Nonetheless, participants are able to withdraw from the interview or not answer an interview question that will make them feel uncomfortable as a sensitive topic is being raised. Moreover, every participant will be asked the same set of questions which are divided into 5 categories that was made based of the literature review.

- o Awareness
- o Safety Issues
- o Marketing Communication
- o Audiences Perspective
- o Effect on Target Market
- o Suggestion

Thus, total of 24 questions on perspective and experience towards the marketing of Fair and Lovely. Finally, each interview will last approximately 20 minutes and will be recorded and transcribed through MS Teams, while one participant prefer conducting the interview through Zoom Meeting. Conducting the interview online allow the participants to feel more comfortable and freely in order to share their opinions and perspective towards the research study.

Moreover, in data analysis it has the aim to minimise, record, organise, and assign credibility to data that are collected. Qualitative researchers must strike a balance between the requirement to be brief and the need to preserve their data's richness (Polit & Beck, 2010). Therefore, as this research study follows a qualitative approach it is most suitable to use the NVivo software, which are usually used for researchers that are obtaining qualitative methods for their research study. Through NVivo the data which are collected are analysed by thematic analysis. Thematic analysis enables pattern dictation within the data, thus emerging themes become the categories for investigations (Fereday & Muir-Cochrane, 2006). Firstly, the data that are collected are transcribed, and move towards coding, analysing the data, evaluation, and end on the validation of the data. The process of transcribing the interviews can aid the researcher in gaining a better knowledge of the subject by allowing the researcher to listen to and read the transcribed interviews multiple times (Conroy, 2010). Once it has been analysed and categorised in an organised way, a theme will occur in which thematic analysis will come in finding the patterns of the collected data and looking for any similarities or differences. Lastly, verification of data, which entails double-checking the correctness of the researcher's understanding by rechecking the transcripts and codes, allowing the researcher to confirm or alter hypotheses already made (Sarantakos, 1998).

III. RESULTS

- A. Awareness
 - a. Encounter Ads

All the participants are aware about Fair and Lovely by

encountering it through televisions advertisement in India:

"Yes, I have. I've seen it on TV." (Participant 5) "I came to know about Fair and Lovely through TV advertisements." (Participant 10) Participant 5 had also mentioned that she had encountered Fair and Lovely advertisement from posters and billboards which are placed along the road. Additionally, she had also bring up that sha has seen the brand advertisement through "in some movies also".

Furthermore, the participants thoughts towards the marketing delivering of Fair and Lovely is mainly focusing towards fair skin: "I think the commercial is 1. Like encouraging at their current customers to have fair skin." (Participant 8) "During the advertisements they try to promote for fair skin and light skin tone." (Participant 3) "Advertise a product as something to make you fair."(Participant 5)

b. Thoughts on Marketing Practice

Moreover, the participants also mentioned that they think the marketing of the brand has shown unrealistic beauty looks for the Indian audiences:

"The advertisement and the videos and the people, the way that people look in the videos are unreal and it's not possible for anybody to look like that." (Participant 5) "I think it is such an unrealistic expectation that people or like society have and everyone watches TV and ads nowadays." (Participant 7)

B. Safety Issues

a. Ingredients Impact Purchasing Behaviour

Most of the participants has stated that a product ingredient do impact their purchasing behaviour:

"Well yeah, if I heard it is good review from other people and if it's good ingredients I will buy it. But if the ingredients are bad or harming our skin then why would I waste my money on buying those kind of stuffs." (Participant 1) "Yes they do. Because when I'm buying product, I want to make sure that I'm safe after using it. So that's why I like to look at the ingredients." (Participant 3)

Nevertheless, Participant 4 believe that she only looks at the key ingredient of a product, in which she means "if I want to have a more flowing skin, I would look for an ingredient that contain niacinamide." thus, specifying on her currents need. She further elaborate that "if I encounter several ingredients that are - I know it is dangerous, then I will not buy the products immediately." which Participant 1 also has the same thoughts if she sees any "bad or gaming our skin" she would not "waste my money on buying those kind of stuffs".

b. Fair and Lovely as a Safe Product

Majority of the participants has mentioned that they do not think Fair and Lovely is completely a safe product:

"No, I do not believe it's a safe product." (Participant 3) "I would not say 100% safe." (Participant 4) "Not really, no. I mean like from what I understand, it's a skin whitening cream. So, there could be long term damages." (Participant 2)

C. Marketing Communication

a. Fair is Beauty

Many participants has shared their thoughts on Fair and Lovely marketing communication and they believe that the brand is classifying fair skin as beautiful among any other skin types: "I feel the underlying message they want to market it as the same, if you have fairer skin, then you're more beautiful." (Participant 3) "Everybody has to be fair to be pretty." (Participant 5)

Moreover, Participant 1 has classified it as a problem in which she said "their problem is giving a message to make your skin look whiter." Additionally, Participants 2,6, and 8 all have the same perspective in elaboration to the marketing message as fair is beautiful they also think Fair and Lovely is delivering a message that"

"If you're not fair enough you don't succeed in your life or like you don't get married or like get a good job." (Participant 6) "To be successful and to be confident, it all comes with how pale your skin is." (Participant 2) "I think the advertisement implicitly saying that in order for us to succeed in order for us to be accepted in society... we have to have lighter skin in order for us to be better ." (Participant 8)

D. Audiences Perspective

a. Effectiveness

Among the 10 participants which was interviewed most of the participants mentioned that the product is not effective: "Uh, I do not think it is very effective, or maybe it might make your skin lighter, but I do feel even if it does, it may have negative effects on your skin." (Participant 3) "Umm, I did not see any much difference. Well, I saw some brightening effect in my skin, but after not using it for like 2 weeks and three weeks after that it comes back." (Participant 4)

Participant 5 shared the experience of her relative on using the brand's product and highlighted that it did not give out any changes "my mother was using it and it made no changes.". In addition, participant 10 rated the effective from a scale of 1-10 and gives it a "maybe 3 - 4, it doesn't show the results, how they're shown in TV."

Consequently, almost all the participants excluding

one participants has stated that they are not willing to purchase Fair and Lovely: "I would not buy that product based on what their beliefs are." (Participant 2) "It makes me don't want to buy the product." (Participant 9) "I already like turn my back from Fair and Lovely and I would not buy the brand anymore and would not support them anymore." (Participant 1)

Another participant would also not purchase it because of the brand's history: "I might not be very keen on buying it just because of the history." (Participant 7)

b. New Brand Name

All the participants has different thought when asked about the change of Fair and Lovely name to Glow and Lovely, but most are still unsatisfied with the change of the brand name: "It doesn't make any much difference in my opinion." (Participant 4) "Portrayed them in a bad light, so I feel just because they (Fair and Lovely) came under fire for that , they changed their name." (Participant 3) "It's stupid, it's just that maybe they want it to be in the line of cosmetics. They didn't have any other options, so they just change it to Glow and Lovely" (Participant 6)

c. Inclusivity and Diversity

In contrast to the respond on the change of the brand name where many are still unsatisfied in the transformation, when asked whether this could be an approach to a more inclusive and diverse movement by Fair and Lovely many agree that this could be the first step: "Maybe it is the first step they have taken in future they might." (Participant 3) "Yeah, I would say yes, because glow. I think the word 'Glow' itself." (Participant 4) "Yeah I agree, it is an approach to be more inclusive. Because Fair and Lovely is very limited and specific meaning and goals, right. Whereas, Glow and Lovely has a wider meaning." (Participant 1)

Additionally, Participant 10 agree that it is an approach to a more inclusive and diverse brand however "it all depends on their marketing and advertisement. That's the area".

E. Effects on Target Audiences

a. Negative Effect

Most of the respondents believe that the advertisement of Fair and Lovely has given out a negative effects towards them: "I think from the answers it's quite clear that it's a negative impact. Setting unrealistic expectations for young girls" (Participant 7) "I think it drives me into more negative side than positive, because those advertisement making me feel more insecure." (Participant 1)

Participant 1 continued that the advertisement also effected the beauty standard in India, "it can damaging the beauty standard in India.", in which participants 8 and 9 also mentioned that Fair and Lovely has soon "fit up

to this one standard (fair skin)" (Participant 8) "set a standard for the Indian beauty standard" (Participant 9)

b. Insecurity

As mentioned above by Participant 1 that the advertisement made her feel insecure, this was also felt by most of the other participants: "It makes me insecure with what I already had." (Participant 9) "Messages that they send could be quite harmful to girls or to people who are insecure." (Participant 2) "I mean, even I for a second thought I was not fair enough to be pretty" (Participant 5)

c. Unethical Marketing

All the participants believe that Fair and Lovely has conducted an unethical marketing in the way they promote their brand to the Indian audiences: "I believe it is, yes, it is unethical." (Participant 3) "Yes, I think it is very unethical because it's sort of contradicts the nature of Indian people like their natural skin." (Participant 9) "Yes, it is unethical. It is not right to claim something that is not true." (Participant 5)

F. Suggestion

a. Eliminate False Advertisement

The last question of the interview asked every participants on what Fair and Lovely could do better in the future, which most participants believe that they should remove false advertisements: "No false advertising about how you know if you are pale, you can be successful and that is not how it should be." (Participant 2) "Incorporates more realistic expectations." (Participants 7) "No point in just making false claims" (Participant 5)

Additionally, both participants 8 and 9 also mentioned that they would hope for Fair and Lovely to promoted "healthy skin" compare to fair skin.

b. Inclusive Brand Ambassadors

Three of the participants believe that Fair and Lovely should also incorporate the right brand ambassadors to promote its brand that showcase different skin colour in which the Indian audiences can relate towards: "Choosing the right influencers or the right celebrities to advertise." (Participant 4) "Choosing brand ambassadors that are not just dusky or dark." (Participant 10) "I think they should give like inclusive approach in the future, like by hiring female actress with like different skin colour." (Participant 1)

IV. DISCUSSIONS

A. Findings

Based on the interview findings above it shows that Fair and Lovely marketing communication towards the Indian audiences does not lie upon an ethical marketing practice,

rather an unethical marketing this is supported by common theme of all the participants in this research study who believes that Fair and Lovely has indeed conducted an unethical marketing as a way in promoting its product to the Indian audiences. As part of the effect towards the Indian audiences, it is also shown that the marketing communication of the brand has mostly impacted the audiences negatively by which it also leads to insecurity that occurs in the audience's perspective as a result of watching Fair and Lovely advertisements that they mostly see on television. Additionally, it also impacted in defining the beauty standard in India that is set to be 'Fair = Beautiful', in which the participants believe to be 'damaging' and completely disagree.

This further correlates with the literature review of this research study, in which the history of India has affected the people today into thinking that fair skin is classified as beautiful and could bring you a great social status. Furthermore, this leads to the way Fair and Lovely has communicated its marketing practices for the Indian audiences that shows a clear racist stereotypes, governing a simple principle that once you have used the skin-whitening product you will be guaranteed with success, social benefits, making your family proud, and above all the ultimate beauty. This tie with the response of the interviewed participants that they feel insecure and limited as to the beauty standard in India as it is only seen as one thing which is 'Fair', without having a lighter skin they are afraid that they could not acquire the happiness and success as portrayed through the marketing communication of Fair and Lovely as a result of purchasing its product. As also mentioned by the literature review above, as a result of the marketing communication by Fair and Lovely that depict prejudice based on race has engages and directs human behaviour, leading consumers to seek escape routes (La tour and Zahra, 1989) by producing worry and tension in contribution to the audiences insecurity after watching the advertisement of Fair and Lovely.

Through the interview findings a consistent theme occurs in which the majority of the participants have shared their perspective that they do not believe Fair and Lovely products are completely a safe product. As a brand that produces and sells skin-whitening products the participants believe there might be harmful ingredients that are incorporated into the product itself, that will allow the consumers to obtain the results as shown by the advertisements. The interview of the findings also shows multiple participants believe that the product could lead to long term damages for the consumers skin condition. Moreover, the findings are supported by the literature review findings, which mentioned that skin-whitening creams or products contain harmful ingredients that could lead to multiple skin health issues and damages in order

to acquire the fair skin result.

Additionally, this leads to the effectiveness of the product itself, through the literature review it is believed that Fair and Lovely do not incorporate any dangerous ingredients in the products, but it is stated that without these ingredients the effectiveness of the product comes in question as consumers cannot acquire the expected result as shown through their advertisement without these ingredients being included in production of the products. Hence, another theme that rises up during the interview finding include all the participants of the research study thinks Fair and Lovely is not very effective, many do not see any differences or changes as highlighted by advertisement, furthermore the participant also gives out a rating from 1-10 on the effectiveness and was only given from 3-4 which is placed in the lowest numerical scale.

In consequence, the findings show that most participants are not willing to purchase Fair and Lovely due to the beliefs and history of the brand. Nonetheless, this contradicts with the literature review findings that although there are multiple critics that arose towards the advertisements of Fair and Lovely the annual sales of the brand still holds a major number of more than \$560 million in South Asia (Chandani, 2020).

Moreover, through the literature review findings it is found that Fair and Lovely has recently changed its brand name to Glow and Lovely due to the petition that was created by Chandana Hiran and signed by nearly 15,000 people (Bose, 2020) in order for Fair and Lovely to shift the message of their marketing effort on the skin-whitening product that is encountered by the Indians in their daily lives. In account to this, a striking theme shows that multiple participants are still unsatisfied with the change of the brand name, they believe Fair and Lovely might only change the brand name due to the raging amount of protest from the petition and could not see any difference act that the brand has tried to transform in communicating their brand's message, thus the Indian's audience are still unsatisfied regarding the movement the brand has taken.

On the other hand, in contrast to the dissatisfaction of the participants on the transformation of Fair and Lovely brand name, a significant common theme finding was that all participants agreed the change of the brand name is indeed a first step taken by Fair and Lovely in becoming a more inclusive and diverse brand. Hence, this could also be seen through the findings of the literature review which state that embracing inclusivity and diversity could lead to 'high performance' in the industry (Torres and Murray, 2000).

An emerging theme throughout the interview findings shows that in order for Fair and Lovely to communicate its

marketing better towards the Indian audience in the future they should eliminate false advertisement as mentioned through the literature review findings that Fair and Lovely conduct false perception and advertisement for its product. Other than eliminating false advertisement it is also suggested through the finding that Fair and Lovely should adopt inclusive brand ambassadors to promote the brand in a more diverse and inclusive marketing communication. Therefore, based on the findings from both interview and literature review the ethical practice of Fair and Lovely is considered unethical as a way the brand's communication is marketed to the Indian audiences.

V. CONCLUSION

A. Conclusion

The aim of this research was to assess the ethical position based on the Indian audiences for Fair and Lovely, observing how the Indian audiences perceive Fair and Lovely marketing activity, exploring the Indian audiences level of responsiveness towards Fair and Lovely, and understanding whether Fair and Lovely has affected the Indian audiences positively or negatively. In order to investigate the research questions a qualitative approach in the form of semi-structured interviews is conducted. Obtaining the semi-structured interviews has allowed for more in-depth insight into the personal experiences alongside the perspective of the Indian audiences towards the marketing communication of Fair and Lovely. This discussion was able to be held in a more open and honest manner, making the interpretation and analysis of the findings more meaningful. A review of the literature was presented corresponding to the research topic on the ethical behaviour of Fair and Lovely marketing communication towards the Indian audiences. Finally, an interpretation of the findings was presented, as well as an explanation of why the findings were significant to the research, including parallels to previous studies.

Additionally, in response to the research question Fair and Lovely has communicated their marketing ethically yet an unethical approach has been used in the marketing of the brand. Based on the findings of this research, the unethical practices are interrelated and highlight from the history of the India, the portrayal of racial discrimination of the advertisement, the effectiveness of the product, and the effect it has influenced towards the Indian audience in which it leads to insecurity and negative effect. Moreover, this study highlights the further approach Fair and Lovely should take in order for it to obtain an ethical practice in delivering its marketing communication through a more inclusive and diverse approach, as this would increase the performance of the brand.

B. Recommendations

Through the finding of this research study, it suggests the importance of ethical practices towards marketing communication of a brand. Thus, as the finding suggests Fair and Lovely marketing practice is considered to be unethical, the brand should further transform its marketing to a more ethical way. It is believed that inclusivity and diversity is prominent in today's industry. As suggested by the interview findings, for Fair and Lovely to adopt a more ethical marketing they could incorporate inclusive brand ambassadors to promote the brand, thus grabbing more audiences towards Fair and Lovely, obtaining more loyal customers, and allowing a more positive brand image. Alongside, eliminating false advertisement is also a way for Fair and Lovely in delivering the marketing communication ethically, this will allow a more realistic beauty standard for the Indian audiences as well as away from racial discriminations that can threaten or leads to psychological effect such as insecurity and being afraid for the audiences that watches Fair and Lovely advertisement.

In addition, a recommendation for Fair and Lovely to further adopt a more ethical practice includes incorporating safe ingredients in its product, hence leading to a more effective result of the product that can satisfy the consumers along with the audiences. Promoting the product with the right messaging words as a way for Fair and Lovely to communicate its brand to the audiences, such as advertising healthy skin rather than fair skin will place Fair and Lovely a more positive response from the Indian audiences.

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Paper 11

Evaluation And Development Of Library Business Model:
Case Study Of ABC University Library

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Abstract - The current ABC University Library business model does not match the needs of users or academic community of ABC University with the speed of technology growth and disruption in the education sector as well as the crisis due to Covid-19 pandemic, and changes in users' behavior. The study focuses on handling one situation that the ABC library business model at the time of the research was insufficiently adaptive to the current disruptive and digitized environment. This research was conducted using a qualitative case study method, with data collection by observation, document analysis, and interviews. The research model is carried out by evaluating the business environment and SWOT evaluation of the business model canvas. As a result, a new business model proposal was made for the ABC University Library with the concept of a hybrid library, namely a library that harmonizes electronic and printed collections side by side and provides services that integrate traditional libraries with digital-based libraries and even have the opportunity to serve not only the ABC University academic community but also the upper management, as well as external parties or individuals or organizational partners.

Keywords - Business Model, Business Model Innovation, University Library, Digital Environment, Disruptive Environment, Innovation

I. INTRODUCTION

University library is a library that is an integral part of education, research and community service activities and functions as a learning resource center to support the achievement of educational goals located in universities. [1] In general, the task of the university library is to provide collections, literature, and facilities to fulfill the information needs of the academic community in higher education.

ABC University Library has a printed collection of 80% consisting of books, newspapers, magazines, journals, and final works. So that the university academic community who needs library collections for teaching materials, classroom learning, final project preparation, and research need to come to the library to look for collections and borrow the required collections. Most of the library service activities are carried out with integrated offline services at each library location. So that when people want to consult with librarians, ask for help in finding collections according to the required subject, checking for plagiarism,

and information literacy, almost everything is done in the library room.

However, with changing environment and current development in the health sector, the current situation that all is done in the library becomes an obstacle when there is a disruption in higher education. The COVID-19 pandemic has caused a major disruption to the education system throughout human history, which has caused 200 countries in the world to close schools, [2] so they must adapt and switch to online learning. The library business model that prioritizes printed collections and offline services becomes irrelevant in this condition. If the campus is closed, the library room cannot be accessed either. The intention to switch from printed format collections to electronic collections began to occur with the high demand for eBooks procurement from students, lecturers, and upper management.

According to Professor Rhenald Kasali quoted by Harusilo (2022) national educational institutions must be ready to face a wave of changes. Disruption, one of which comes from new technology. [3] In addition, ABC University also has Online Learning, which is distance learning for employees who want to study while working. So far, online learning students must come to the library if they want to borrow a collection or use the library services. In addition, the pandemic has also made distance learning for all regular students and lecturers so relevant, even after the pandemic. Thus, hybrid learning is still being implemented. This makes the business processes of the library, which are almost all carried out in the library room, do not meet the needs of its users. Whereas libraries or information centers must always provide information resources and make them accessible to meet their users' needs. [4]

The gap situation or problematic situation described above creates the idea of the need for a new way of doing things in the library. The business model of that university library must be revisited.

The business model is the benefit model for all stakeholders of the core business activities. It refers to the design of value creation, value delivery, and value capture in the organization of each activity the organization has. It is also used to describe and classify businesses, especially in the entrepreneurial or exploration sphere and exploitation sphere when the business model is a way to model how the organizations realize or exploit the opportunity

identified. The business model is of utmost important for the business as it models the value created, delivered, and captured for the consumers in particular and stakeholders in general.

In relation to value, according to Osterwalder & Pigneur (2010), a business model describes the rational of how an organization creates, delivers, and captures value [5]. Business models that experience changes in how the value is created, delivered, and captured, it is known as business model innovations. The degree of newness in the changing of Who, What, Where, When and Why as well as How within the business model will determine the level of innovation in the business model. The business model innovation relates as well with the changing in the key stakeholders' relationships, not only in the who, but also the why, the what, the when, the where. The higher the newness or changes in those new components, the higher the degree of innovation. In the long run, innovative business model creates benefit not only for the business but also for the community/society. It shows how important the changes and innovativeness in the business model to cope with the current situation.

Business models are attractive for two main reasons [6]: "can be vehicles for innovation" because they have the capacity to "unlock the potential value embedded in new technologies"; and can become "subjects of innovation". [7] In mapping the business model, the researcher uses a business model canvas (Business Model Canvas (BMC)) which describes, visualizes, assesses, and changes the business model based on nine building blocks, namely consumer segmentation, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure. [5]

There are several research about business model in library such as Surpassing the business model: a public sphere approach to public library management, by Koizumi, M., & Widdersheim, M. M. (2016). This study describes public library innovation from the perspective of library management and the concept of public space [8]. The other research conduct by Oyelude, Adetoun A., Ola, Christopher Olumuyiwa and Adeniran, Ezekiel Adelere (2021) with titled Improving services in a hybrid academic library system (2021) This research the purpose of the research in this article is to explain if in a hybrid library system, a mix of traditional or manual and how to carry out library operations with new, modern, and automated systems often brings some problems. Problems are things that can be overcome if the human resources involved in the change or improvement process are ready to cooperate and manage the system library properly, as well as the necessary service improvements will need to be identified and adopt a strategic plan for the systematic implementation of the change [9]. But researcher have

not found any research that evaluating and developing new business model in private university library.

The purpose of this research is to evaluate and create a new business model for ABC University Library that is in accordance with the conditions faced and will be faced by libraries in the future. So that it can accommodate the needs and in line with the goals of the library to be achieved. Because the wrong business model will harm the institution and will not be successfully implemented if it is not in accordance with the needs of the institution. The right business model can help organizations to increase the competitiveness of institutions in the eyes of their consumers as well as to provide an overview of the business resilience of ABC private University in the future.

To explain the evaluation and development of ABC University Business Model, this paper will consist of introduction about the library, business model, gap and research purpose, research methodology, Research Result that explain current ABC University Library business model, and its evaluation by business environment and SWOT. Discussion about purpose new Library Business Model proposal and the strategy about its implementation.

II. METHODOLOGY

The research was conducted with a qualitative research approach with a case study method. Qualitative research was chosen because in business planning and decision making, qualitative research can be used to determine market segmentation, new product development, and in particular concept testing, sales analysis, brand assessment and development, and understand various processes, including consumer decision-making processes, and case studies were chosen in order to present the specificity and complexity of a case and seek to understand the case in a particular context, situation, and time. [10]. This research was conducted in a participatory manner so that researchers could be involved in the process, feel, and blend in with the existing environment.

This research was conducted at ABC University Library, especially the central library located on the Kemanggisan campus in West Jakarta. Because that is where the origins of various collection policies and services come from, it is also the most widely used by academic community. However, the researcher also examined several ABC University Library at other campuses such as Bandung, Alam Sutera (Tangerang) and Senayan (Central Jakarta) campuses, to find out whether other campus ABC University Library has had similar problems to the ABC University Library's at the Kemanggisan campus, and to see how the business processes were affected by the disruption there.

The flow of this research model is that researchers collect by: Observations made on ABC University Library business processes, New Services, Changes in academic community Behavior, Pandemic Impact, and digitization of ABC University Library & ABC University Library business processes affected by the disruption. Then interviews were conducted with ABC University Library managers as decision makers and Library leaders. Then the Section Head (a kind of branch head of ABC University Library) at ABC University Library campuses in Bandung, Alam Sutera, and Senayan, frontliner staff, and library users, to find out the impact of technology disruption, pandemics, changes in academic community behavior, and implementation of service adaptations carried out. The last is data collection by means of document analysis on New Service Publication documents, Service Guidelines, Collection and Service Usability Data, Collection Procurement Data,

& Organizational Structure. Then do the analysis and data reduction. The result is an ABC University Library business model, then a business model assessment is carried out by evaluating the business environment, and evaluating the business model based on Strengths, Weaknesses, Opportunities, Threats, or SWOT. Based on the assessment, a new business model proposal and suggestions for business model implementation are made.

III. RESULTS

A. ABC University Library Business Model

In explaining the ABC University Library business model canvas, researchers will use the theoretical basis written by Osterwalder & Pigneur (2010) [5], because this theory is the most widely used and suitable for the analysis of this research.

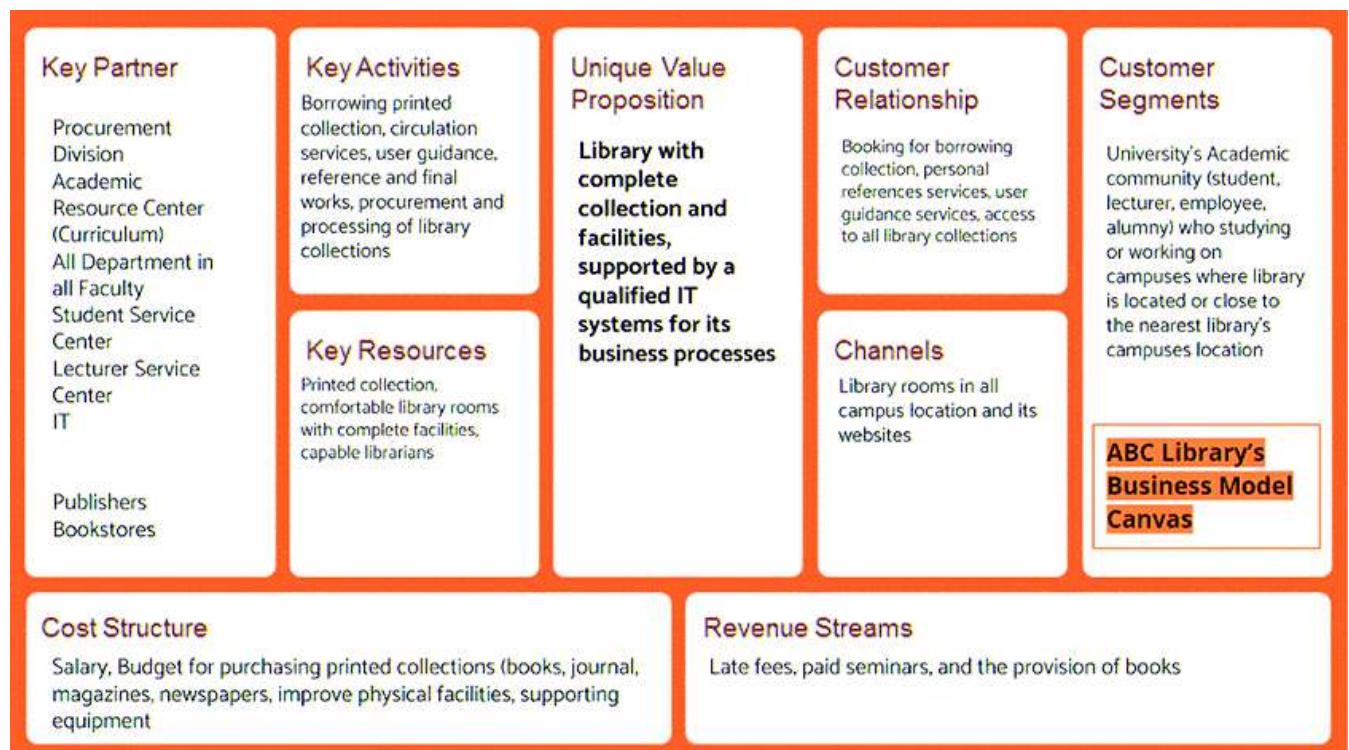


Fig. 1. Business Model Canvas ABC University Library

In the ABC University Library canvas business model above, it can be seen that:

- The customer segments are all academic members (Lecturers, Students, Employees, Alumni) studying or working on campuses where ABC University Library is located or close to the nearest ABC University Library location.
- Its value proposition is a library with complete collections and facilities, supported by a qualified IT system for its business processes.
- The channel is ABC University Library Room in all locations.
- Its customer relationships are bookings for borrowing collections, personal reference services, user guidance services, access to all library collections.
- Revenue Streams / Impact value: based on observations and interviews, what is considered as revenue is late fees, paid seminars, and the provision of books
- Key Resources: Printed collections, comfortable library rooms with complete facilities, capable librarians

- g. Key Activities: Borrowing printed collections, circulation services, user guidance references and final works, procurement, and processing of library collections
- h. Key Partners, are divided into two namely: Internal key partners: procurement division, Academic Resource Center (curriculum section), all majors at ABC University, Student Service Center, Lecturer Service Center, IT. External: Publishers and Bookstores
- i. Cost structure: Salary, Budget for purchasing printed collections (books, journals, magazines, newspapers) updating of physical facilities, renovations, & supporting equipment

B. Business Model Evaluation

1. Evaluation of the Business Environment

Business models are designed and run in a specific environment. Develop an understanding of the organizational environment and help envision a stronger and more competitive business model. Continuous environmental scanning is more important than ever due to increasingly complex economic landscapes (e.g., networked business models), greater uncertainty (e.g., technological innovation) and severe market disruptions (e.g., economic turmoil, disruptive new Value Propositions). [5] Business Environment Evaluation is divided into 4 namely Market Forces, Macroeconomic Forces, Industry Forces, and Key Trends.

o Market Forces

a. Market Segments:

- Geographic: When the study is conducted onsite, the customer segment is academic community who studies at each campus that has a Library in it or is close to a certain campus library. Then when online or hybrid learning is applied, the customer segment is academic member, especially lecturers and students wherever they are located. It may be spread throughout Indonesia or abroad because online learning can be done from anywhere.

- Demographics: Most of the students are young adults between 17-25 years old, master, and doctoral students are 22-40 years old, lecturers are 25-70 years old, and employees are 20-65 years old. With the upper middle-income class.

- Psychographic: Middle to upper social class

- Behavior: Students and young lecturers often use gadgets in their daily lives, students tend to come to

the library when they have assignments, to do group assignments, presentations, look for books, or need a place to rest, senior lecturers like to use printed books. Employees tend to rarely come to the library.

b. Need & Demands:

Online / hybrid learning makes the need for access to printed collections from home, various electronic collections, online library services increase. However, when the campus was opened, academic members of university also needed offline services and printed collections in the library. In addition, according to the acquisition of ABC University Library, the demand for books in electronic format has increased in recent years, especially by lecturers.

c. Market Issues: The use of technology and the internet is increasing due to the pandemic

d. Switching Cost: Switching to Google or pirated products

e. Revenue Attractiveness: The provision of eBooks makes access and coverage wider than printed books with limited copies

o Macroeconomic Forces

Not affected

o Industry Forces

a. Competitors from offline bookstores, online bookstores, online eBook stores,

b. Influential Stakeholders: University academic community member & Upper Management

c. Suppliers: the supply of imported printed books is constrained due to regional restrictions during the pandemic, while eBook suppliers provide discounts and free trial access

d. Substitute product/service: Google

o Key Trends

a. Technology: The use of devices with the internet in reading or accessing information

b. The most influential regulatory trend is health protocols during the Covid-19 pandemic, in addition, although there are regulations regarding piracy and intellectual property rights, there is no clear action.

c. Socio-Cultural Trends: Indonesian people's interest in reading is still low

2. Business Model SWOT Analysis

Assessing a business model from a big picture perspective and assessing it from a Building Blocks perspective is a complementary activity. An effective way to do this is to combine the classic strengths, weaknesses, opportunities, and threats (SWOT) analysis with the Business Model Canvas. The SWOT analysis provides four perspectives for assessing the elements of a business model, while the Business Model Canvas provides the focus needed for structured discussion. This type of SWOT analysis provides the basis for further discussion, decision making, and ultimately innovation around the business model. [5]

a. Results of Analysis of BMC ABC University Library Strength and Weakness

The table below is the result of the SWOT 9 Building Block evaluation of the current ABC University Library business model canvas. Based on the results of the Cost/Revenue assessment or can be considered as Impact Assessment and Customer Interface Assessment (Channel, KEY Resource, Key Activities) all have the lowest scores, namely -23 and -27. The score indicates that the current BMC ABC University Library is not strong enough to have a positive impact on all academic community when there is a crisis and shift in the world of education. Disrupted customer interfaces due to campus closures during the pandemic, library collections of which 80% are printed collections, and the development of online services that have not been developed or implemented have made the level of usability of collections, facilities and services in the library decreased drastically. As a result, the positive impact provided by libraries, such as providing information resources for learning, teaching, research, and community development in universities, can hardly be done at all. This is what makes the Impact Assessment low value. So that the value proposition cannot be given (score 0) and the Infrastructure Assessment is score -5 because it cannot meet the needs of ABC University academic community.

Table 1 - RESULTS OF ANALYSIS OF ABC UNIVERSITY LIBRARY'S BMC OF STRENGTH AND WEAKNESS

Building Block	Score
Value Proposition Assessment	0
Cost/Revenue Assessment	-23
Infrastructure Assessment	-5
Customer Interface Assessment	-27

b Result of BMC ABC University Library threat analysis

Based on the threat assessment at BMC ABC University Library at this time, 3 out of 4 assessment values are negative, namely value proposition, infrastructure, and customer interface threats. These threats come from outside, which can come from competition, applicable regulations, or technology development, as well as crises such as the Covid-19 pandemic that changes business process systems and consumer behavior.

Consumer Interface treats are the highest threat with a score of -29, when academic member cannot access the library, threats from competitors and distribution channel constraints have an impact on the value proposition, and the impact given by the library to university academic member. The more negative the impact, the more likely academic community will switch to buying his own books, downloading eBooks from other sources, and looking for material from information sources such as the internets that are not necessarily validated.

Table 2 - RESULT OF BMC ABC UNIVERSITY LIBRARY THREAT ANALYSIS

Building Block	Score
Value Proposition Assessment	-7
Cost/Revenue Assessment	-14
Infrastructure Assessment	3
Customer Interface Assessment	-29

c. Result of BMC ABC University Library opportunity analysis

Table 3 - RESULTS OF ANALYSIS OF ABC UNIVERSITY LIBRARY'S BMC OF OPPORTUNITY

Building Block	Score
Value Proposition Assessment	23
Cost/Revenue Assessment	24
Infrastructure Assessment	44
Customer Interface Assessment	-95

However, the opportunity for ABC University Library is still very large based on the table below, if the systems, processes, and collections at ABC University Library are optimized by adapting and innovating according to academic community needs and the demands of the times, it will have a good impact on the future of ABC University Library, university academic community, and ABC University in the future.

In SWOT 9 Building Blocks and Threats, the most negative score and the impact on other assessments is the Customer Interface score. However, in this table the highest opportunity is the Customer Interface value. This shows that if the main improvement priority is Customer Interface improvement, by improving it, the possibility of increasing the value proposition, cost/revenue, or positive impact that Library can provide and opportunities for infrastructure improvement will also increase.

By looking at the overall positive values in the assessment table for ABC University Library opportunities to develop, we can conclude that the library will be able to survive if adaptation and innovation are carried out in accordance with the needs, demands, and developments of the times.

IV. DISCUSSION

A. Proposed new business model for ABC University Libraries: "Library Beyond the Walls" with hybrid library concept

ABC University Library will put all online and offline library services with a hybrid library concept into a package under Library Beyond the Walls. Library Beyond the Walls literally means a library that is more than just a building, meaning a library that can provide access to information anywhere and anytime, both inside and outside the library. This concept also refers to the functions and benefits of libraries that are more than we know, namely providing information resources for their users. However, libraries can also be a bridge for innovation, scientific development, discussion facilities, support for distance learning, and even support for higher education goals in terms of income and value offered. Then supported by excellent service or service excellence, which is the basis of its business model, it is hoped that the library can provide the best service that exceeds the expectations of the ABC University library academic community.

A hybrid library is defined as an organizational entity that collects all academic assets including metadata, catalogs, primary sources of library materials, learning objects, datasets, digital storage, and library physical collections in a structured and well-managed manner [11]. Based on the description of hybrid libraries proposed by Oppenheim and Smithson in Guy (2000) a simple way to define hybrid libraries is a means to integrate traditional libraries (printed collections) with digital libraries [12]. By using the website as a mechanism tool to provide information to users, where users can create, and store personal information resources needed [13].

The previous ABC University Library business model was more focused on still prioritizing printed book collections and integrated services in the library room. However, along with its development, especially the disruption in the form of a crisis due to campus closures due to the Covid-19 Pandemic, ABC University Library has begun to adapt and innovate in its collections and services. ABC University Library was unable to provide most of its services in the early days of the Covid-19 pandemic due to the lockdown applied to all campuses. Employees also all work from home or Work from Home while students and lecturers learn and teach online from their respective homes. ABC University itself is quite ready for the needs of distance learning or Online Learning because ABC University has a department that organizes Online Learning for workers who also want to continue their studies. This has been held for years located in ABC University Jakarta, Palembang, and Semarang.

Even so, the closure of the campus is a big disruption for ABC University Library, whose 80% collections and services are printed collections with the regulation that academic community member needs to come directly to the library if they want to borrow Library's collections or use most of Library's services. During the Pandemic, top-level management asked all operational and service divisions to form new services so that they could still accommodate the needs of academic community during distance learning, which was implemented especially in the regular undergraduate (S1), graduate (S2) and doctoral classes. So, the development of internet-based services was developed. if previously only international journals, plagiarism checking services, and book lending bookings that can be done online via email, so the development of this internet-based service includes the development of all existing services such as circulation services, final work services, reference services, user guidance services, online fine payments, and upgrade e-Collection. In addition, new services that did not exist previously were also developed, such as Library Virtual Tour, Library Room Booking, Reference Clinic, Book Delivery Services and Drive Thru.

The ABC University Library collection was also developed by expanding into electronic formats other than printed formats. The addition of a collection in this electronic format has been initiated since 2019 but has not been able to immediately acquire massive electronic collections due to the problem that not all book titles are available in eBook versions or not all e-magazines can be accessed by many academics. In addition to the limited budget per year. Even so, shifting to eBook format has become a regulation since 2019, that books submitted for purchase are prioritized for those available in eBook format, if not available, they will be purchased in printed format. Meanwhile, shifting of periodical collections such as magazines, newspapers and journals has begun to be massively carried out by ABC University Library starting in 2020 and 2021. With almost all magazines and journals previously subscribed to in a printed format, their subscriptions have been shifted to an electronic format that can be accessed through the ABC University Library website from anywhere by using the internet. This is in accordance with the notion of collection management [12] namely collection management is ensuring that the collection grows in the right direction. In its efforts to improve quality research, provide teaching and learning resources, hybrid college libraries have a focus, namely providing up-to-date collections that can be accessed by diverse users in various formats.

Based on observations, document analysis, and interviews conducted by researchers, researchers saw a transition of collections and services carried out by ABC University Library leading to a hybrid library, namely library collections

leading to collections with printed and electronic formats which are now almost the same size. All ABC University Library services can be accessed in two ways, namely online and offline by coming directly to the nearest library location. This is in accordance with the explanation of Oyelude, Ola, & Adeniran (2021). Hybrid libraries exist on a continuum between conventional and digital libraries, where electronic collections and paper-based information sources are used side by side with each other[9]. Therefore, According to Veeranjaneyulu, Mahapatra, & Visakhi (2012) Based on the idea of systematic integration and methodological thinking, hybrid libraries should integrate information sources in various formats, and user interfaces, and build new models of organization and human resources that will be useful in solving problems that occur in the implementation of digital library projects, such as the separation of development, management and services of printed collections, and digital information sources, as well as improving the overall efficiency of library operations. incompatibility of the business model with the new services provided. [14]

B. Proposed new business model canvas for ABC University Libraries: "Library Beyond the Walls" with hybrid library concept

Based on the Hybrid Library Business Model Concept, here are the updates for each of the new ABC University Library Business Model Canvas Building Blocks:

1. Consumer segmentation

Consumer segmentation is defined as different groups of people or companies who are the goals to be reached and served [5]. The group of people who are the target of ABC University Library services, including consumers. The market is limited because the business model run by ABC University Library targets a special market that caters to certain and special consumer segmentations, namely the ABC University academic community or what is called academic community, which includes all students (students, lecturers, employees) Regular & Online learning. This group also has the same method and purpose in accessing ABC University Library, namely for learning and teaching purposes, research, and the community. It is just that in the new business model, this segmentation pays more attention to segmentation based on geography, namely when the recovery is carried out onsite, the customer segment is academic community who studies at each campus that has a Library in it or is close to a certain campus Library. Then when online or hybrid learning is applied, the customer segment is academic community, especially lecturers and students wherever they are located. It may be spread throughout Indonesia or abroad because online learning can be done from anywhere. With this division ABC University Library must also provide services and collections that can be accessed from

anywhere. In addition, what needs to be considered is behavioral segmentation: young students and lecturers often use gadgets and the internet in their daily lives, students tend to come to the library when they have assignments, to do group assignments, presentations, look for books, or need a place to rest, senior lecturers like to use printed books. Employees tend to rarely come to the library. In the segment based on this behavior, there are library users who like to use printed books and are comfortable in the library room, and there are also those who are comfortable using access to electronic information sources with their devices.

Another consumer segmentation is the Institute or ABC University which is the provider of operational funds to the library. The purpose of the library needs to be in line with the goals of the institution and support the institution to have the desired impact. The Institution's objectives are stated in the ABC University Quality Objectives 2021-2025, which include All Faculty Members have International Papers, 1000 Intellectual property rights have been legally registered, One out of three study programs have been accredited internationally, The Academic Satisfaction Index achieves 80%, and The Stakeholder Satisfaction Index achieves 80%.

Lastly, library customer is the external parties. In providing the best and most comprehensive services and collections, ABC University Library cooperates with various agencies. In the future, this can be improved by providing impact value through student exchanges or comparative studies of libraries in friendly countries, even, if possible, in the form of cooperation in exchanging information packages for teaching and research purposes between institutions or countries. In addition, the library also cooperates with the Library Consortium or the College Library Forum for subscriptions to international journals so that subscription fees become cheaper with complete access and can be used together. In the future, this collaboration can be increased by not only providing value but also profit by collaborating with publishers and bookstores, by providing places to advertise either on the website or at events organized by the ABC University Library. Other collaborations that can be done are renting out places for exhibitions, bookstores or renting educational tools, as well as ordering books for individuals through the ABC University Library for the academic community who want to have books from the library collection.

2. Value Propositions

The value proposition of the new business model proposed by researchers for the ABC University Library is Library Beyond the Walls, namely the library provides service excellence with the concept of a hybrid library, which is in line with the goals of higher education, and

supports the development of the academic community, community, and society in terms of education, research, and education. Socioeconomic Service Excellence will help libraries meet the needs and expectations of their users, by continuously adapting and providing the best. With the concept of a hybrid library, it is appropriate for the needs of ABC University library consumers with different teaching and learning locations (on campus, at home, anywhere) as well as for the academic community who are comfortable using printed and electronic collections and services in the library room or online. This concept will also make the ABC University Library useful for external partners, communities and the public, because it offers more support than university libraries can provide, namely, the ease of increasing profits for publishers and bookstores through advertising and direct book sales access to consumers in need through ABC University Library, developing various communities at ABC University by providing a place for learning, discussion and innovative facilities, such as theater room facilities for film majors, as well as participating in community empowerment by providing paid/non-paid seminars/webinars, free teaching for children streets, help develop school libraries, and so on.

3. Channels

Previously, the distribution channels were library websites and library rooms at various locations on the ABC University Library campus in various locations. now the distribution channel, especially the website, will be updated with additional integrated library applications. It aims to develop the convenience of accessing the library online and searching for printed books in the library. Meanwhile, physical distribution channels such as library rooms will continue to function. In addition, to support the value proposition of the new ABC University Library, social media, messenger apps (WhatsApp), Email, zoom apps, and YouTube will be optimally used.

4. Customer Relationship (Customer Relationship)

Students or lecturers can request Information Search Guidance services both online and in class. For students who buy packaged textbooks, they can get assistance on post-purchase access if they have difficulty accessing them and a money back guarantee if they run out of stock. ABC University Library customer relationship improvement proposals:

a. For the academic community: ABC University Library can offer increased benefits for the academic community who often come to the library, borrow books, and use library services. The benefits are in the form of an additional number of books that can be borrowed and awards for

the academic community who are active customers of the library, invite their friends to the library, and transact book purchases at the library.

b. For external consumers of ABC University, benefits are provided such as for external partners who advertise on the ABC University Library website, for a minimum of 3 months, you will get an additional benefit of 1 month of advertising in multiples. External partners who are sponsors of ABC University Library events will have the opportunity to advertise on the library's website, put a logo on the event banner, play advertisements during the event, or make direct marketing presentations in front of seminar or webinar participants, depending on the agreement and the value of the sponsorship provided. External partners who rent a place near or around the ABC University Library for exhibitions will benefit from free advertising during the exhibition on the library's website or banners in the library room. Partners who exhibit at least 2 weeks will get access to places to advertise during external library activities such as seminars. Some of this idea ever did in ABC University Library before but it did not continue again nowadays.

5. Revenue Streams

There are 2 streams of benefits that can be provided by the library as a non-profit division and university supporter:

a. Impact Value

The ABC University Library, which is under ABC University, and gets its budget every year from there, has a Third Party funded model relationship with the University it is under. So that the goals and benefits of the library must be in accordance with the goals and benefits that the parent institution wants to obtain or provide. Even so, in the theory of the Triple bottom line model, revenue streams are replaced with impact values, namely improving the quality of graduates, the quality of research, teaching and learning, accreditation of universities and majors, developing innovation, increasing customer satisfaction at libraries and universities, and so on.

b. Supporting University Revenue

ABC University Library assists in supporting university revenue in accordance with the tasks assigned by the university. Revenue or income that can be obtained by the library, among others, is through distribution of student packages of textbooks, paid seminars, licenses for developing innovation and research collaborations, renting out exhibition spaces, placing advertisements, joint activities with external parties (sponsorship, purchasing individual books through the library, and so on)

6. Key Resources

The ABC University Library has several main resources,

namely physical Main resources consisting of library rooms, buildings, library networks on various campuses, plus a collection of printed and electronic information sources as well as offline and online library services and information technology. Intellectual resources consist of databases of the academic community, and data collections owned by the library, human resources of 40 people in various locations consisting of managers, librarians, and library staff.

7. Main Activities (Key Activities)

Key Activities describe the most important things a company must do to make its business model work. ABC University Library's main activities can be categorized as problem-solving or information services. The main activities are offline and online library services, procurement and processing of printed & electronic format collections, community development, and the development of science and innovation.

8. Key Partnerships

There are no changes to the main partnership in the new business model. The ABC University Library's primary partnerships are with internal institutions and external institutions. Internally, the ABC University Library partners with the curriculum section in requests for book data to be ordered, finance, procurement for collection purchases, facilities and infrastructure, IT department for smooth collections and facilities, Student Service Center for active student data updates. In addition, internal partnerships are also carried out with other related divisions such as quality control, finance, knowledge management, advisory centers, upper management and community and community development sections. For external partnerships carried out with publishers, and bookstores to help procure collections, university forums and various domestic and foreign agencies such as Bank Indonesia and embassies of other countries in improving library collections and services.

9. Cost Structure

The Cost Structure describes all the costs incurred to operate a business model as well as describes the most important costs incurred when operating under a particular business model. [5] The costs incurred by the ABC University Library are fixed costs, namely costs that remain the same even though there is an increase in the volume of goods or services produced. consisting of, employee salaries, the cost of purchasing additional book collections, and subscription fees for magazines, journals, and newspapers, as well as costs for updating or repairing physical facilities, making/maintaining library websites and applications, capital funds for webinars/seminars, and

community development funds & Public.

C. Proposed Implementation of the new ABC University Library business model with the Star Model

For the implementation of the proposed BMC ABC University Library, researchers illustrate by combining the Canvas with Jay Galbraith's Star Model to suggest aspects of organizational design that may want to consider when executing a business model. Galbraith specifies five areas that should be aligned in an organization: Strategy, Structures, Processes, Rewards, and People. While the business model places in the middle of the star as a "center of gravity" that holds the five areas together [5]

1. In strategy or direction

The new strategy in the business model puts forward the fulfillment of different business needs. This strategy requires strong distribution channels and effective integration between libraries in multiple locations. Because it is possible that with the flexibility of the learning location academic community will borrow collections from the library which is closer to his home even though it is not their campus. In addition, the number of electronic collections needs to be increased as much as the printed collections. So that academic community member always has the choice to get the source of information needed anywhere and under any conditions. But if so, IT Infrastructure need to be strength.

2. Structure or power

Centralized Leadership and Supervision Structure with all services and collections are integrated with each other.

3. In terms of process or information

All services and collections of ABC University Library in all locations can be accessed and integrated with each other and in real time. So that users can check printed books or access eBooks anywhere and anytime. If a printed book is borrowed, it will be checked at which library location is closest to the location of the user who wants to borrow and the availability of the book at the library. So that users are faster to access the collections needed. For eBooks or electronic collections purchased, the priority is with unlimited access, so that all academic community can access them at one time. Therefore, a website and a strong internet connection are needed so that online and offline services can run smoothly. Even so, offline services continue to run. Therefore, HR needs to learn time management, communication, and training related to IT. All information regarding services and collections must also be known to all ABC University Library employees so that there is synergy and can provide excellent service.

4. Rewards

With the increase in types of services and collections, it will be better if there are awards for employees such as the Library best employee award. Where the winner can get 1 day off, whatever day he wants without being deducted from his leave or salary, or family meal vouchers, etc. So that employees are motivated to improve their performance. Awards are also given to library users who frequently access or borrow books or invite their friends to use library services, disseminate information about libraries and others will rewards on The Best Library User Award, and the award will be added to their portfolio and library website.

5. People

The human resources needed are those who understand the work in the library with a background in library science majors or trained employees who have worked in the library for a long time. There is no need for additional employees or replacement of Library employees, however, to achieve the business model objectives, training on services, communication, interpersonal skills, as well as efficient performance training is needed to align with the needs and objectives to be achieved by the business model. Improving the quality of human resources will also increase the value of the library in the eyes of its consumers.

V. CONCLUSION

The proposed new business model Library Beyond the Walls with the aim of providing service excellence with the concept of a hybrid library, which is in line with the goals of higher education, and supports the development of the academic community, community, and society in terms of education, research, and socio-economics that is proposed to be able to accommodate the needs of the academic community, even more so that it is able to make university libraries become independent institutions. Because it provides online and offline services that are as good as supported by collection development that is not only focused on printed collections but also electronic collections such as e-books, e-journals, e-magazines, and others, as well as distribution channels for main activities, partners, key resources, and leadership support in accordance with the library's future goals in line with the needs of the community. So that adaptation and innovation in the new business model is very suitable to be applied in the ABC University library today and in the future

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Paper 12

The Influence of Male Beauty Influencer Review on Social Media Towards Female Purchase Intention on Local Cosmetic Products

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ICMEM

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Abstract - In the era of digital media, many local cosmetic brands compete in the beauty industry with various advantages offered through social media beauty influencers. Currently, brands are no longer contented with discovering influencers who own the same sex as the product users and strive to develop their target market across gender to show that cosmetics can be for everyone. Therefore, the purpose of this research is to examine the source credibility of opposite-sex beauty influencers and to determine suggestions that can be executed by the local cosmetic brands as their strategies in determining male beauty influencers to increase purchase intention. A quantitative approach using an online survey was conducted with 320 female respondents in Indonesia. The findings of this research indicate that there is a significant influence of expertise, attractiveness, and trustworthiness on consumer attitude; attractiveness and trustworthiness on para-social interaction; consumer attitude and para-social interaction on purchase intention. Consequently, local cosmetic brands might utilize the findings to guide their selection of male beauty influencers with whom to collaborate to gain the most significant advantage from successful marketing.

Keywords - Female Buyers, Opposite-sex Beauty Influencer, Local Cosmetic Brand, Purchase Intention, Social Media

I. INTRODUCTION

Currently, in the era of digital media, the beauty business demands to bring out a social media influencer marketing strategy. Beauty brands have to practice relevant marketing strategies to communicate their product messages to the purchasers. Influencers lead today's driving beauty marketing approaches, designing the most significant part of Voice for the beauty industry in the five powerful voices (influencers, owned media, media, partners, and celebrities) [1]. Influencers remained the most critical subscribers to driving buzz and Media Impact Value for businesses in this market, considering 55% of the value. Brands commonly recognize that social media influencers can be observed from the credible viewpoint of the concerned audience which gives a meaningful and significant effect on purchase intentions [2]. Moreover, credibility dictates that they can uniquely express the attractiveness of the product and suit its representation and the spokesman [3]. Any other way,

the perception of a credible influencer qualification also reaches the specifications, for example, having inherent characteristics such as expertise, uniqueness, and trust [4].

Also, in today's business era, customers spend extra attention on the brand business when buying products [5]. Many local and international brands are competing in the beauty industry with various solutions and advantages offered through social media beauty influencers. Tasya Farasya, Abel Cantika, Sarah Ayu, Cinderella, Sara Robert, Ludovica Jessica, Kiara Leswara, Lizzie Para, Molita Lin, Fatya Biya, Almiranti Fira, and Stefany Talita Visa are examples of beauty influencers in Indonesia. As a result, the majority sex of beauty influencers in Indonesia is female. Females invest significantly in their outward appearance in a society where their appearance of features are distinguished for their beauty [6].

Indonesia's rising beauty products business has presented a vital opportunity for local cosmetic brands to start and expand their dominance in the Indonesian market competition. Local cosmetic brands are competing to encourage the purchase intention of female consumers in various ways and channels, one of which is by collaborating with beauty influencers to be able to recommend their products to consumers. However, brands are no longer contented with discovering influencers who own the same sex as the product users and strive to develop their target market across gender to show that cosmetics can be for everyone. Furthermore, in recent years, the boundaries among males and females for product use such as cosmetics have shifted more blurred. Several well-known local cosmetic brands such as Make Over, Rollover Reaction, Wardah, By Lizzie Parra Beauty (BLP) and Emina have started working with opposite-sex (male) beauty influencers to review and promote their cosmetic products. The cosmetics industry has conventionally been considered feminine and frequently gendered formulated on normative sexual dualism. Despite the fact that the social part of both genders has evolved extremely in recent years, various cosmetic advertisements still represent women and men in the standard environment for advertising brands. The current shift towards a less gendered society is changing the alternative products promoted to modern cosmetic enthusiasts.

Since local cosmetic brands proliferated in Indonesia, the function of influencers in influencing consumer buying

interest and purchase intention is unavoidable. Customer buying interest is a critical determinant in product purchasing decisions [7]. The products appropriated by social media influencers brought 40% of customers purchasing decisions [8]. The previous study reveals that the opposite-sex beauty influencer positively impacts the attitudes towards the marketing activity and the product itself [5]. When the product has particular intimacy, the influence on the attitudes towards the advertisement also has a positive result.

Many types of research prove how the social media influencer's review impacts the consumer's purchase intention towards beauty products. Nonetheless, some studies discuss the influence of opposite-sex beauty influencer reviews on social media towards female purchase intentions on local cosmetic products. Thus, this research is conducted to examine factors on opposite-sex beauty influencers that affect local cosmetic brands' purchase intention. These factors mean the source of credibility of the influencer which consist of expertise, attractiveness, and trustworthiness.

II. LITERATURE REVIEW

In supporting the current research, the researcher found out that source credibility leads to a positive feature of the influencer that can enhance recognition and encouragement all across the process of marketing. Therefore, it indicates that social media influencers, opposite-sex beauty influencers, that serve as the origin of online evaluations of a product will retain an influence on customers' attitudes regarding businesses because the public perceives them as credible. In the context of influencers, the source credibility model contains three primary determinants of purchase intention: expertise, attractiveness, and trustworthiness. Moreover, another study discovered that the credibility of the source based on expertise, trustworthiness, and attractiveness do have a significant influence on para-social interaction [9]. When a person feels they share many similarities with an influencer, the influencer's actions own a greater impact. Therefore, the hypotheses of this research are developed as follows.

- H1a : There is a significant influence between the expertise of opposite-sex beauty influencers and consumer attitude towards the local cosmetic brand.
- H1b : There is a significant influence between the expertise of opposite-sex beauty influencers and Para-social Interaction (PSI)
- H2a : There is a significant influence between the attractiveness of opposite-sex beauty

influencers and consumer attitude towards the local cosmetic brand.

- H2b : There is a significant influence between the attractiveness of opposite-sex beauty influencers and Para-social Interaction (PSI).
- H3a : There is a significant influence between the trustworthiness of opposite-sex beauty influencers and consumer attitude towards the local cosmetic brand.
- H3b : There is a significant influence between the trustworthiness of opposite-sex beauty influencers and Para-social Interaction (PSI).
- H4 : There is a significant influence between the consumer attitude towards local cosmetics and purchase intention.
- H5 : There is a significant influence between the Para-social Interaction (PSI) towards local cosmetics and purchase intention.

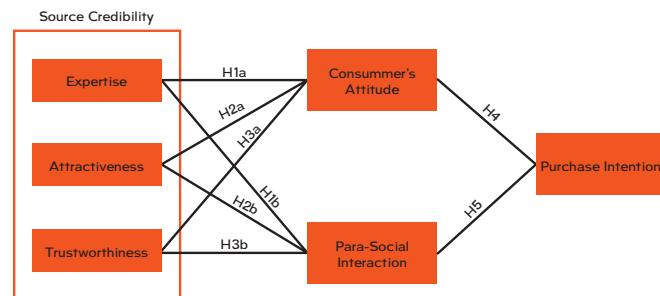


Fig. 1. Conceptual Framework

Modified from Ohanian (1990), Ha & Lam (2016), Zhang, Xu and Gursoy (2020), Lin et al (2021)

III. METHODOLOGY

This study will apply a quantitative method by conducting a survey using an online questionnaire. To ensure that all parties comprehend the questionnaire, the questionnaire will be provided in Bahasa Indonesia, the native tongue of both the researcher and the respondents. The researcher utilized judgmental or purposive sampling in this research. Since the context of this research is to examine the influence of opposite-sex beauty influencer reviews on females' purchase intention of local cosmetics brand products, the selected sample must females who were born between the years 1997 and 2012 aged 10-25 [10] years old (Generation Z), have purchased local cosmetic brands for a minimum of six months, know at least one male beauty influencer in Indonesia who reviews local cosmetic products. The female population was selected because according to Allied Market Research (2019), the number of Indonesian women who are concerned about

their looks, physical well-being, and grooming is growing, and the female segmentation led the Indonesian cosmetic products market.

The questionnaire employs a five-point Likert Scale to measure respondents' degree of agreement with many hypothetical circumstances related to the influences of opposite-sex beauty influencers' reviews on females' purchase intention. In order to enhance output quality and effectiveness while minimizing participants' "frustration level," a five-point Likert-type scale was selected [11]. The data will be analyzed using the PLS-SEM approach via the SmartPLS program. SmartPLS software was utilized by the researcher to assess the relationship between all variables employed in this study, which include expertise, attractiveness, trustworthiness, consumers' attitude, para-social interaction, and purchase intention.

The questionnaire was developed by adapting relevant literature and modifying the variance questionnaires from various studies related to this research topic. The inquiry structure of the questionnaire of survey is displayed in table below.

Table 1 - INDICATORS OF QUESTIONNAIRE

Expertise		
Label	Indicators	Items
E1	Expert	Male beauty influencers, in my opinion, are local cosmetic experts.
E2	Experienced	Male beauty influencers, in my opinion, have sufficient experience in the local cosmetic industry.
E3	Qualified	Male beauty influencers, in my opinion, have high professional qualifications in the local cosmetic industry.
E4	Skilled	Male beauty influencers, in my opinion, have proficient expertise in the local cosmetic industry.
Attractiveness		
Label	Indicators	Items
A1	Similarity	I feel similar to the male beauty influencers concerning facial features or skin type.
A2		I have similar thoughts and views to the male beauty influencer in reviewing local cosmetic products.
A3	Familiarity	All of the male beauty influencers mentioned in the preceding section are familiar to me.
A4	Likeability	I like how male beauty influencers talk about or review local cosmetic products.
A5		The male beauty influencer is likeable person.
Trustworthiness		
Label	Indicators	Items
T1	Dependable	Regarding local cosmetic products, I can depend on the opinions of male beauty influencers.
T2	Honest	When it comes to discussing or reviewing local cosmetic products, I see male beauty influencers being open and honest.
T3	Reliable	The opinions of male beauty influencers on local cosmetic products are reliable.

T4	Sincere	The male beauty influencers' opinions on local cosmetic products are sincere.
T5	Trustworthy	When discussing or reviewing local cosmetic products, I see the male beauty influencer is not ostentatious or exaggerated.
Consumer Attitude		
Label	Indicators	Items
CA1	Believe	When the male beauty influencer also mentions the goodness of the local cosmetic brand, I believe it is a good brand.
CA2	Think	When the male beauty influencer is like the local cosmetic brand, I also think the local cosmetic brand concerned by male beauty influencers has a good quality.
CA3	Like	When the male beauty influencer likes the products, I also might like the local cosmetic brand product.
CA4	Good/Bad	After noticing the male beauty influencer state that the local cosmetic brand has a pleasing quality, I believe it has a good quality.
CA5	Confident	After hearing or reading about the local cosmetic brand from male beauty influencers, I am confident in the product.
Para-social Interaction		
Label	Indicators	Items
PSI1		I am excited to watch his videos, read his posts, and leave comments on his social media platforms.
PSI2		I would follow him and communicate with him on other social media platforms.
PSI3		I feel like I am a part of the male beauty influencer's group when I watch him.
PSI4		I consider the male beauty influencer to be a buddy of mine.
PSI5		I would like to see the male beauty influencer face to face.
PSI6		I would read a story about a male beauty influencer if it appeared in a newspaper or magazine.
PSI7		I feel completely comfortable with the male beauty influencer as if I am with my best friends.
PSI8		When a male beauty influencer expresses his feelings about a local cosmetic brand, it guides me form my point of view about the brand.
Purchase Intention		
Label	Indicators	Items
PI1	Seek Product	I'm looking for a specific local cosmetic product that has been reviewed or discussed by male beauty influencers.
PI2	Seek Information	I might look for information on a specific local cosmetic product that has been reviewed or discussed by male beauty influencers.
PI3	Try Product	I might try a specific local cosmetic product that has been reviewed or discussed by male beauty influencers.
PI4	Motivated to Purchase	I will be persuaded to buy a specific local cosmetic product that has been reviewed or discussed by male beauty influencers.
PI5	Purchase	I am interested to purchase a specific local cosmetic product that has been reviewed or discussed by male beauty influencers.

IV. RESULTS

The findings of demographic and behavioral questions have explained the fact that the majority of respondents to this questionnaire are females aged 17-23. As a result, the data showed that cosmetic users are females who are in high school and college age because they want to look beautiful and take care of themselves through cosmetics. As they age, they might adapt their beauty selection of products to suit their needs [12]. Due to their continuous occupation as college students as well as school students, the majority of respondents spend around Rp100.001 – Rp250.000 per month, making them more price sensitive and conservative in their expenditures. In addition, respondents who did not seek reviews from male beauty influencers before buying local cosmetic products were 172 respondents (53.8%) more than respondents who first sought reviews of male beauty influencers with 148 respondents (46.3%). From this data, it can be concluded that there are still many female consumers who do not refer to male beauty influencers in Indonesia as a reference when buying local cosmetic products.

Furthermore, for the main data analysis, the researcher used SmartPLS software to evaluate the relationship between all variables used in this research, which include expertise, attractiveness, trustworthiness, consumers' attitude, para-social interaction, and purchase intention. There are several important phases that must be done before the researcher continues the data analysis process, such as the phase of determining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The computation result is shown in the figure below.

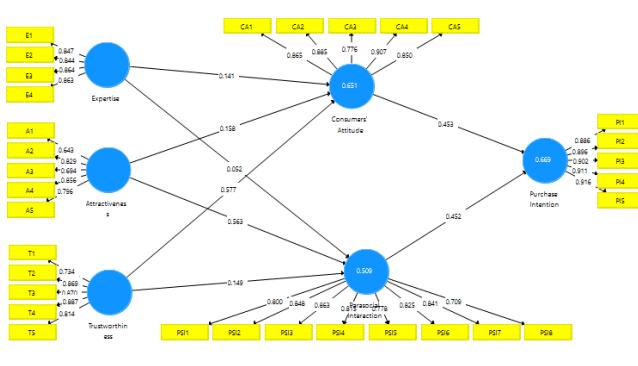


Fig. 2. PLS Algorithm Result

To determine the data's relevance, the variable's value should be larger than 0.7 for the absolute standardized outer loadings [13]. According to the results of the outer loadings, certain indicators have been recognized as not reliable, which is indicator A1 and A3. Therefore, to decide whether indicator A1 and A3 should be removed or remains used, the researcher will further conduct the CR and AVE tests to assess each variable.

Table 2 - INDICATOR RELIABILITY RESULT

Variables	Indicators	Outer Loadings	Reliability
Expertise (E)	E1	0.847	Reliable
	E2	0.844	Reliable
	E3	0.864	Reliable
	E4	0.863	Reliable
Attractiveness (A)	A1	0.643	Not Reliable
	A2	0.829	Reliable
	A3	0.694	Not Reliable
	A4	0.856	Reliable
	A5	0.796	Reliable
Trustworthiness (T)	T1	0.734	Reliable
	T2	0.869	Reliable
	T3	0.870	Reliable
	T4	0.887	Reliable
	T5	0.814	Reliable
Consumer Attitude (CA)	CA1	0.856	Reliable
	CA2	0.885	Reliable
	CA3	0.776	Reliable
	CA4	0.907	Reliable
	CA5	0.850	Reliable
Para-social Interaction (PSI)	PSI1	0.800	Reliable
	PSI2	0.848	Reliable
	PSI3	0.863	Reliable
	PSI4	0.815	Reliable
	PSI5	0.778	Reliable
	PSI6	0.825	Reliable
	PSI7	0.841	Reliable
	PSI8	0.709	Reliable
Purchase Intention (PI)	PI1	0.866	Reliable
	PI2	0.896	Reliable
	PI3	0.902	Reliable
	PI4	0.911	Reliable
	PI5	0.916	Reliable

However, as can be seen in Table 2, all composite reliability scores are greater than 0.7. As a result, it can be concluded that all of the variables are reliable and may be used in the subsequent analytic procedure.

Table 3 - VALIDITY TEST RESULT

Variables	Composite Reability	Average Variance Extracted (AVE)	Reliability
Expertise (E)	0.915	0.730	Reliable
Attractiveness (A)	0.877	0.590	Reliable
Trustworthiness (T)	0.921	0.700	Reliable
Consumers' Attitude (CA)	0.933	0.736	Reliable
Para-social Interaction (PSI)	0.939	0.658	Reliable
Purchase Intention (PI)	0.956	0.814	Reliable

The discriminant validity result might be examined using the square root of the AVE value. The square root of AVE has to be higher than the correlation between the latent variables in passing the discriminant validity test [14].

The AVE square root findings for each latent variable are presented in Table 3 below, shown diagonally and in bold. The AVE square root of each latent variable is greater than all of the results of the correlations among latent variables suggesting that the discriminant validity test was completed for all variables as shown in the table below.

Table 4 - DISCRIMINANT VALIDITY RESULT

	E	A	T	CA	PSI	PI
E	0.855					
A	0.648	0.768				
T	0.706	0.708	0.837			
CA	0.651	0.659	0.789	0.858		
PSI	0.522	0.702	0.584	0.632	0.811	
PI	0.592	0.765	0.685	0.739	0.739	0.902

In addition to discriminant validity, a heterotrait-monotrait (HTMT) ratio test is used to assess the comparability of each latent variable. In this study, the researcher puts the threshold value at 0.90 because the SmartPLS software would output invalid data for the HTMT ratio if the number is more than 0.90. In this study, the heterotrait-monotrait ratio reveals that all variables are valid because the values are less than 0.90. As a result, the researcher can continue to the following test in the study.

Table 5 - HETERO TRAIT-MONOTRAIT RATIO RESULT

	E	A	T	CA	PSI	PI
E						
A	0.756					
T	0.798	0.820				
CA	0.727	0.753	0.873			
PSI	0.563	0.788	0.628	0.674		
PI	0.649	0.862	0.474	0.797	0.778	

The bootstrapping method investigates the correlations of each hypothesis in SmartPLS by examining the inner and outer models [14]. Bootstrapping will eventually offer a T-test to determine the significance of the path [13]. Researchers could assess whether the hypothesis is accepted or rejected based on the outcomes of data analysis through bootstrapping. The researcher could use bootstrapping to determine whether the hypotheses are accepted or rejected based on the analyzed data. The significance and inner model path coefficient of the hypothesis are supported by T-values, P-values, and original samples. Table 6 summarizes the outcomes of the hypothesis testing.

Table 6 - HYPOTHESIS TESTING RESULT

	Structural Path	Original Sample	T-Value	P-Value	Result
H1a	E → CA	0.141	2.516	0.012	Accepted
H1b	E → PSI	0.158	0.737	0.462	Rejected
H2a	A → CA	0.577	3.033	0.004	Accepted
H2b	A → PSI	0.052	10.056	0.000	Accepted
H3a	T → CA	0.563	9.708	0.000	Accepted
H3b	T → PSI	0.149	1.998	0.046	Accepted
H4	CA → PI	0.453	8.308	0.000	Accepted
H5	PSI → PI	0.452	8.135	0.000	Accepted

This study has eight hypotheses in total. According to Table 6, only one hypothesis is rejected, while the others are accepted. Hypotheses 1a, 2a, and 3a are accepted since the T-value is 2.516, 3.033, and 9.708 respectively which are more than 1.96 at a 5% significance level and have original sample values greater than 0. This indicates that expertise, attractiveness, and trustworthiness have a significant and positive influence towards consumer attitude. On the other hand, hypotheses 2b and 3b are accepted since the T-value is 10.056 and 1.998 respectively which are more than 1.96 at a 5% significance level and also have original sample values greater than 0. Thus, attractiveness and trustworthiness have a significant and positive influence towards para-social interaction. Lastly, hypotheses 4 and 5 are accepted since the T-value is 8.308 and 8.135 respectively which are more than 1.96 at a 5% significance level and also have original sample values greater than 0. Therefore, consumer attitude and para-social interaction have a significant and positive influence towards purchase intention. However, the remaining hypotheses which is hypotheses 1b is rejected since the T-value is 0.737, which is less than 1.96 at a 5% significance level. Even though the hypotheses 1b do not generate significant influence towards the para-social interaction variable, the expertise still resulted in a positive influence because the original sample values are above 0.

V. DISCUSSION

The first hypothesis assumed that the expertise of opposite-sex beauty influencers has a significant influence on consumer attitude toward the local cosmetic brand. According to the analysis of data, their relationship is positive and significant. Hence, this hypothesis is accepted. This result is consistent with the findings of a prior study done by [15] which discovered a significant relationship between competence and customer attitude. According to the findings of this study, the expertise of opposite-sex beauty influencers has a positive impact on customer attitudes about a local cosmetic business. As this hypothesis is supported in this study, opposite-sex beauty influencers should be seen as competent, informed, experienced, and skilled providers of beauty

advice especially in cosmetics, as they recognized the qualities of the expertise attribute defined by [16]. This assertion is also confirmed by one of the indicators in the expertise variable, Experienced, "Male beauty influencers, in my opinion, have sufficient experience in the local cosmetic industry", which has the highest mean score among the other indicators in this variable. This assertion may reflect why viewers seek for opposite-sex beauty experts' opinions on local cosmetic items. As a result, to develop positive attitudes of female customers toward the recommended local cosmetic company, the male beauty influencer should be viewed by the viewer as an expert in the beauty industry, particularly cosmetics. Moreover, local cosmetic brands should examine the competence of male beauty influencers with whom they wish to collaborate, particularly their talent, background, and understanding in the cosmetic industry. If a local cosmetic business selects the perfect male beauty influencer who is an expert in the beauty sector, it may allow them to express the brand information correctly, resulting in a good consumer attitude toward their business.

The second hypothesis assumed that the expertise of opposite-sex beauty influencers has a significant influence on para-social interaction. According to the analysis of data, their relationship is positive but not significant. Hence, this hypothesis is rejected. This discovery contradicts the findings of recent research by [17], which discovered a significant influence between expertise and para-social interaction among its influencers and their viewers. This interaction also happened between opposite-sex (male) beauty influencers and their audiences, in this instance female cosmetic enthusiasts. As a result, it can be argued that male beauty influencers cannot be viewed as experts by their audiences in order to increase the depth of their Para-social Interaction (PSI) to respective audiences. Moreover, local cosmetic brands should examine the competence of male beauty influencers with whom they wish to collaborate, particularly their talent, background, and understanding of the cosmetics industry. If a local cosmetic firm assigns the ideal male beauty influencer who is an industry expert, they tend to have a significant Para-social Interaction (PSI) intensity with their audiences, which may contribute to improved purchase intention.

Another hypothesis assumed that the attractiveness of opposite-sex beauty influencers has a significant influence on consumer attitude toward the local cosmetic brand. According to the analysis of data, their relationship is positive and significant. Hence, this hypothesis is accepted. This outcome is consistent with the results of a prior study done by [18], which discovered a significant relationship between attractiveness and customer attitude. Familiarity, resemblance, and likeability of male beauty influencers with their audiences have a key impact in the construction of consumers' sentiments about local

cosmetic products, as this theory is supported in this research [16]. As a result, local cosmetic businesses should assess the attractiveness of male beauty influencers with whom they wish to collaborate, notably their likability, similarity, and resemblance with their targeted audience. From the findings of this research, female consumers tend to follow male beauty influencers because they are likable people. If a local cosmetic business selects the correct and pleasant male beauty influencer for their market, it may result in a positive customer attitude toward the brand.

The other hypothesis assumed that the attractiveness of opposite-sex beauty influencers has a significant influence on para-social interaction. According to the analysis of data, their relationship is positive and significant. Hence, this hypothesis is accepted. This finding is consistent with [19] examination of earlier research, which revealed a substantial effect between beauty and para-social interaction among its influencers and their viewers. This connection also occurred between opposite-sex (male) beauty influencer and their respective audience, in this case, female cosmetic enthusiasts. Beauty influencers are more inclined to interact in an intimate relationship with their audience as a reviewer who is considered appealing by their audience. As a result, it can be stated that the attractiveness of male beauty influencers might drive to Para-social Interaction (PSI) with their audiences, which in this instance are female cosmetic enthusiasts. Consumers may notice that male beauty influencers can describe or evaluate local cosmetic items in an appealing manner, which may improve the complexity of their Para-social Interaction (PSI) with their followers. Male beauty influencers with unique and appealing looks and styles can strengthen their connection with their audiences. If male beauty influencers have an attractive physical appearance, viewers are more inclined to spend more time viewing their cosmetics products. The male beauty influencer and his audience will develop a closer bond as a consequence of their regular interaction. Influencers, particularly male beauty influencers in this study, appear to have stronger persuasiveness and credibility since their followers are more inclined to connect to them [20]. Moreover, local cosmetic brands should analyze the attractiveness of male beauty influencers with whom they wish to collaborate, notably their likability, familiarity, and resemblance with their audiences. If a local cosmetic business selects an attractive male beauty influencer, they have a significant Para-social Interaction (PSI) intensity with their viewers, which can result to a favorable purchase intention.

There is also hypothesis assumed that the trustworthiness of opposite-sex beauty influencers has a significant influence on consumer attitude toward the local cosmetic brand. According to the analysis of data, their relationship is positive and significant. This result is consistent with

the findings of a prior study done by [15], which discovered a significant relationship between trustworthiness and customer attitude. Based on the findings of this study, the trustworthiness of opposite-sex beauty influencers has a positive impact on customer attitudes about a local cosmetic business. If influencers are viewed as a reliable and perceptive source of information, the content of product suggestions in their review content will be more persuasive than if the source is viewed negatively in changing viewers' perceptions [16]. It would be preferable if local cosmetic brands delivered detailed knowledge about the product so that male beauty influencers could convey their knowledge to their audience, and even better if local cosmetic brands encouraged male beauty influencers to communicate honest reviews because nothing beats constructive feedback that can be employed by local cosmetic business to continually improve the qualities of their products. When a local cosmetic business selects the perfect male beauty influencer who is trustworthy to their target audience, it may result in a favorable customer attitude toward the brand. If male beauty influencers give a comprehensive product review without exaggerating, female customers like it. As a result, male beauty influencers must also know the characteristics of trustworthiness, which include being trustworthy, genuine, dependable, sincere, and highly reliable [16], in order to have a significant impact on the consumer attitude, which in this case is female, toward the local cosmetic brand under consideration.

Besides that, there is another hypothesis assumed that the trustworthiness of opposite-sex beauty influencers has a significant influence on para-social interaction. According to the analysis of data, their relationship is positive and significant. This result is consistent with the findings of prior research by [19], which discovered a significant relationship between trustworthiness and para-social interaction. According to this study, the trustworthiness of opposite-sex beauty influencers has a favorable impact on para-social interaction between the influencer and their viewers. This connection also occurred between opposite-sex (male) beauty influencer and their respective audience, in this case, female cosmetic enthusiasts. Male beauty influencers, as everyday consumers of cosmetics products, may give trustworthy or impartial comments based on their own knowledge of the product, enabling their audiences to connect to and interact with the review material as well as the male beauty influencers. Because the idea of para-social interaction (PSI) refers to an emotional attachment or connection between online personas and viewers, this engagement and comparable sentiments may indicate the increased para-social interaction between viewers and beauty influencers as reviewers. Moreover, local cosmetic brands should examine the integrity of male

beauty influencers with whom they wish to collaborate, particularly those who are reputable, genuine, dependable, truthful, and responsible. When a local cosmetic brand selects a credible male beauty influencer, they have a significant Para-social Interaction (PSI) depth with their consumers, which can contribute to positive purchase intention.

Furthermore, there is hypothesis stated that there is a positive and significant influence between the consumer attitude toward local cosmetics and purchase intention. This hypothesis is recognized as corroborated by earlier studies by [15], which suggest that audiences with a favorable attitude toward social media influencers, especially male beauty influencers, in this case, are more likely to purchase the influencers' advertised product. Moreover, [21] discovered that the consumer's attitude toward a brand has a significant impact on its buy intention because it is the greatest important driver of purchase intention. This study found that the audience, in this case, females, had a positive attitude towards the brand influencing their purchase intention towards beauty products evaluated by male beauty influencers. Thus, it is critical for a local cosmetic brand to retain a positive consumer attitude, as this will improve the possibility that female consumers would purchase local cosmetic products.

Lastly, the hypothesis stated that there is a positive and significant influence between the Para-social Interaction (PSI) toward local cosmetics and purchase intention. This hypothesis is accepted. The findings of this study are consistent with previous findings by [22] impact on audiences' intentions to purchase items evaluated by beauty influencers. In this situation, media celebrities, particularly male beauty influencers, appear to have stronger persuasiveness and credibility since their viewers are more inclined to connect to them. Audiences are more likely to believe what is being communicated if they assume they are being addressed to directly as a result of their important connection with the presenter [23]. Although the connection among both male beauty influencers and their audiences is only an illusionary one-sided correlation undergone by the audience with beauty influencers in this digital era, it can have a substantial effect on the viewer's intention, which in this particular instance is female, to purchase local cosmetic products that are evaluated by beauty influencers. As a result, it is critical that Para-social Interaction (PSI) be positive and entertaining in order to have a substantial influence on the customer. Additionally, when selecting beauty influencers to collaborate with, local cosmetic businesses should evaluate the Para-social Interaction (PSI) intensity of male beauty influencers with their audiences, which can be determined by reviewing their platform on social media knowledge and insight.

V. CONCLUSION

Currently, influencer marketing has rapidly become the most effective strategy to reach beauty consumers, particularly women as their main target market in the cosmetic industry. In addition to working with male beauty influencers as spokesmodels, collaborations, or endorsements, the local cosmetic company offers them recently introduced items on a continual basis. In return, after testing out the local cosmetic product, the beauty influencers would express their views and impressions on social media. The researcher recommends for local cosmetic businesses in selecting appropriate beauty influencers to be partners, particularly those targeting the younger female consumer market, must be discriminating and cautious in deciding the best beauty influencers to be companions. As a result, in order to effectively enter the market, local cosmetic businesses may select the most attractive, knowledgeable, and trustworthy beauty influencers based on their preferences, even if the influencer has a different gender from the main target market and has a strong stereotype that the product is identical to a certain gender. This research proves that opposite-sex influencers can be effective in increasing purchasing intention as long as they are considered experts, attractive, and honest. Furthermore, through the interaction of consumer attitudes, the expertise, attractiveness, and trustworthiness of male beauty influencers have a positive and significant effect on females' purchase intention of local cosmetic businesses. Nonetheless, the influencer's attractiveness and trustworthiness have a positive and considerable impact on female purchase intention through para-social interaction.

All of the data collected from the responses of the respondents could enable male beauty influencers to improve their quality of review and content. To prevent "fake reviews" of male beauty influencers' content, local cosmetic brands should encourage male beauty influencers to fulfill their guidelines. Alternatively, it would be preferable if local cosmetic brands delivered detailed knowledge about the product so that male beauty influencers could convey their knowledge to their audience, and even better if local cosmetic brands encouraged male beauty influencers to communicate honest reviews because nothing beats constructive feedback that can be employed by local cosmetic business to continually improve the qualities of their products.

Aside from that, local cosmetic brands should always manage the quality of their products so that male beauty influencers may promote their positive experiences with them and urge their audiences to purchase the local cosmetic product that the reviews suggest. As a result, consumers will have a pleasant experience with the

product, as experienced by male beauty influencers.

The insights gained from the gathered information are extremely valuable to a wide range of stakeholders, notably local cosmetic businesses. These recommendations are not only useful for local cosmetic brands, but will also be valuable insights for Indonesian male beauty influencers about how they are viewed by the audience and how to better interact with their audience, especially female audience in this case, which in the end can be beneficial for them, customers, and also a local cosmetic brand.

The next recommendation is aimed at the male beauty influencer itself. As some male beauty influencers rely on the cosmetic industry as their primary source of income, it's critical for them to grasp what factors are crucial for them to be able to engage audiences. Furthermore, male beauty influencers should be able to establish a good consumer attitude and positive Para-social Interaction (PSI) with their audiences, which can contribute to purchase intentions of the local cosmetic products recommended by them. According to the research, male beauty influencers should retain their reputation, which includes expertise, attractiveness, and trustworthiness, across product review content.

In general, expertise refers to the influencer's experience, knowledge, or abilities in a certain field, which in this case is cosmetics. Then, male beauty influencers might acquire attractiveness by being familiar and similar to the audience. Although, in the context of this research, the attractiveness of a male beauty influencer that is liked by female consumers is someone who is likable and has a pleasant and attractive personality. Last, trustworthiness is associated with an influencer's sincerity, integrity, and credibility to be perceived as credible.

Male beauty influencers must also preserve their reputation by always being objective and genuine in giving product reviews; most respondents indicated they dislike it when beauty influencers appear excessive and fake in discussing cosmetic products because of a brand endorsement or collaboration. Being innovative in developing local cosmetic product review content is also something that male beauty influencers should explore in order to maintain the audience's interest and engagement. They also have to be able to create their own strategy and uniqueness in order to compete with existing female beauty influencers in order to be accepted by cosmetic enthusiasts. Last, according to previous data, cosmetic enthusiasts use social media the most on Instagram, especially females. However, based on the results of this study, other social media such as YouTube are also often used as references for female consumers to find product information about local cosmetics. Therefore, male beauty influencers should try and explore other social media as

platforms to review local cosmetic products in order to achieve maximum engagement and results.

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Paper 13

Customer Journey & Marketing Strategy for Smart Pharmacy in Indonesia

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ICMEM

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Abstract - New company models use digitization to shift customer expectations to respond to the changing market. However, smart pharmacy has not been established in Indonesia. The buyer persona identifies who buys the company's products, and the customer journey collects all the prospects and actions customers take with a business. This study use interview, observation, and benchmarking as its methodology. The data sources from the methodology, namely data from the interviews of the pharmacy customers and the pharmacy business owners, observations, and benchmarking then used to determine the customer journey and the ideal buyer persona. The results of this study show that to develop a customer-based experience strategy for smart pharmacy in Indonesia with the data from the buyer persona and customer journey. Based on this study, the customer journey should be split into two paths, the customer journey of buying online and offline, based on the customers' needs. The customer journey was designed with the implementation plans in such a way with three primary considerations: must solve customer problems and pain points, have not been implemented or different from other pharmacies in Indonesia, and must focus on relevant technologies for establishing smart pharmacies in Indonesia.

Keywords - Buyer Persona, Customer Journey, Pharmaceutical Industry, Smart Pharmacy, Technology

I. INTRODUCTION

The world and available technology have altered the principles governing brand development, marketing strategy, and internationalization. While the internet facilitated these changes, the true enablers were software and hardware advancements. Online customers/users now anticipate simplicity (Brouthers et al., 2016) ease, and relevance (Hänninen et al., 2017). According to research and online media, a new type of company is emerging (Bell and Loane, 2010; Brouthers et al., 2016; Wentrup, 2016) that is built on the latest technologies and digitalization, utilizing digital technologies to improve the business model and create new revenue and value-creating opportunities (Hänninen et al., 2017; Nambisan, 2017). What was formerly considered an efficient method is now regarded as impeding rapid and successful growth. Technology can radically alter and improve consumer experiences and staff skills while significantly reducing costs in today's market, especially in the pharmaceutical industry (Agarwal et al.,

2020). Businesses, including pharmaceutical industries, must understand what technologies now accessible and what innovations are on the horizon that can potentially change the pharmaceutical industry (Agarwal et al., 2020). As technology advances, smart retail concepts begin to be adopted in the pharmaceutical industry. The usage of the concept of smart pharmacy induces many benefits, for instance, accessing essential pharmacy information, integrating, and accessing drug information; method of smart pharmacy is when automated personal mobile application services are combined with reporting applications that track the appropriate use and effectiveness of health care, this will inevitably increase satisfaction for all stakeholders by:

- o saving time and money across the health care delivery system
- o simplifying pharmacy benefit design comprehension and utilization
- o enhancing the effectiveness of medication therapy management
- o value-based drug benefit designs and
- o integrating pharmacy benefit design (CDHPs)

In addition, a smart pharmacy is also time efficient. According to a study, 25% of individuals provided drugs for a new illness do not fulfill their initial prescription. Half of the patients on chronic illness maintenance medication discontinue therapy within a year of initiating therapy, costing the health care system billions of dollars in wasteful medical care. The objective is to guarantee that each member takes the prescribed prescription on time and effectively (Oscar, Robert, 2015). The objectives of this study are to identify the customer journey of smart pharmacies in Indonesia, to identify the buyer persona of smart pharmacies in Indonesia, and to develop customer experience for smart pharmacies in Indonesia. In order to develop the customer-based experience strategy for smart pharmacy in Indonesia, the author needs to know the target buyer persona and the customer journey of the persona to understand and implement relevant strategies for developing smart pharmacy in Indonesia.

II. METHODOLOGY

The data sources for this study will be Interviews with Pharmaceutical business owners and pharmacy customers, observation in pharmacy stores, and benchmarking with relevant companies.

A. Interview with Pharmaceutical Business Owners

Because there is information that needs to be collected by the writer to know the current condition of pharmaceutical industries, it is essential to know the information from the business owner themselves regarding the current condition of pharmaceutical industries. Thus, this approach is used. In this research, judgmental sampling is used as the sampling technique. The sample size for this interview is three people, the business owner of pharmaceutical industries. The criterion of the respondent is a person that has established a pharmacy business in Indonesia. Face-to-face interviews collect the data. This technique is chosen because the writer selects people related to the company to provide up-to-date information about the company and its research for its product development. The semi-structured interview comprises various questions aimed at acquiring data on the topics. There is one set of questions for the interviewees' targeted populations (Taherdoost, 2016) The data collected from the in-depth interview is analyzed using open coding. In this study, the coding is done by coloring, with each color representing three separate variables. The labeled interpretations are based on the keywords found in the respondents' statements (Corbin & Strauss, 1990)

B. Interview with Pharmacy Customers

Because there is information that needs to be collected by the writer to know the customer's perspective regarding their needs and wants, it is essential to know the information from the customer himself. Thus, this approach is used. The questions make it easier for the writer to conduct the interview, but they do not restrict the writer's options. The writer must ask further questions if additional information is required to complete the information from the interview (Doyle, 2020) The sample size for this interview is 11 people, the pharmacy customer. In this research, judgmental sampling is used as the sampling technique. The criterion of the respondent is a person that has experienced buying a product from a pharmacy in Indonesia. Face-to-face interviews collect the data. This technique is chosen because the writer selects pharmacy customers to ask for their feedback and their needs regarding the business in the pharmaceutical industry. The semi-structured interview comprises various questions aimed at acquiring data on the topics. There is one set of questions for the interviewees' targeted populations (Taherdoost, 2016). The data collected from the in-depth interview is analyzed using open coding.

In this study, the coding is done by coloring, with each color representing three separate variables. The labeled interpretations are based on the keywords found in the respondents' statements (Corbin & Strauss, 1990)

C. Observation in Pharmacy Stores

This procedure aims to understand the system in the field of how the system works and to begin developing an analysis on optimizing the system in the pharmaceutical industry. The observation is conducted in 3 community pharmacies. The criterion of the pharmacy is a community pharmacy, also known as a retail pharmacy. The setting of the observation will be the writer will come to the observation location and stay on the field for two hours, while on the spot, the writer will observe the pharmacy and ask some customers about their shopping experience in the pharmacy (Kawulich, 2012) The data analysis from the observation is analyzed using open coding. Coding marks and arranges qualitative data to define themes and relationships (Medelyan, 2020) Open coding is the interpretive process through which data is divided analytically. Its goal is to provide new insights to the analyst by interpreting phenomena reflected in the data (Corbin & Strauss, 1990). The detailed step of the observation from entering, waiting, and after going to the pharmacy will be explained below:

- a. The system of the pharmacy
- b. The ambiance of the pharmacy
- c. The facilities that the pharmacy provides
- d. The health protocol procedure
- e. The role of employees available at the pharmacy
- f. The waiting procedure of the pharmacy
- g. The payment method available at the pharmacy
- h. The procedure for obtaining the medicine
- i. The procedure if the medicine is not available at the pharmacy

D. Benchmarking with relevant companies

The company that this study chooses to do benchmarking on should implement an innovation in the pharmaceutical industry that is trying to improve the time efficiency and cost efficiency of the pharmaceutical industry overall. The product must also already be implemented in the smart pharmacy. Below are the criteria:

- o Company & Headquarters
- o Products & Services
- o Accomplishments
- o Innovative Projects

The companies that this study benchmark is four companies that are:

1. Meta-Pharma, Blue Bell, Pennsylvania
2. Kirby Lester, Lake Forest, Illinois
3. Upperinc, Ontario
4. Drugsite Limited, North Shore, Auckland

This study does benchmark because benchmarking enables this study to find areas for improvement to bring value to the research regarding pharmaceutical industries to speed with the development and success. By examining what successful businesses do, this study can design a customer-based experience strategy for improving performance and capitalizing on new possibilities (Dattakumar and Jagadeesh, 2003).

E. Data Validation by Method

In this study, we will conduct observations at three different pharmacies and observe the pharmacy's physical condition and the system. We will use both approaches where the researcher observes and takes notes regarding the customer actions when dealing with touchpoints, the condition of the site, and the system without interacting with other customers, also the settings where we will also participate in the study setting as a participant, in this case as a customer (Kawulich, 2012)

In this study, we will also interview two kinds of participants, the first one is the pharmacy business owner to get a thorough understanding of the current state of the pharmaceutical industry and to collect the data necessary for this research and the second one is the pharmacy customer to gain an understanding of the type of buyer persona, the data to create a customer journey and also the current customer needs. The interview lasted about 15-20 minutes and was conducted in Bahasa Indonesia, which would be translated into English later (Taherdoost, 2016)

Lastly, In this study, we will compare two relevant companies that have already adopted smart pharmacy systems; there, we will identify areas for improvement to add value to pharmaceutical industry research and accelerate its development. By evaluating the practices of successful companies, this study can help develop a

strategy and capitalize on new opportunities (Dattakumar and Jagadeesh, 2003)

III. RESULTS

Based on the data collected from the pharmacy business owner interview, pharmacy customer interview, pharmacy observation, and benchmarking. To develop customer experience for smart pharmacies in Indonesia, the author needs to develop the buyer persona and the customer journey first; therefore, the data that have been collected from the business owner interview, customer interview, and pharmacy observation are used to develop the customer buyer persona and customer journey.

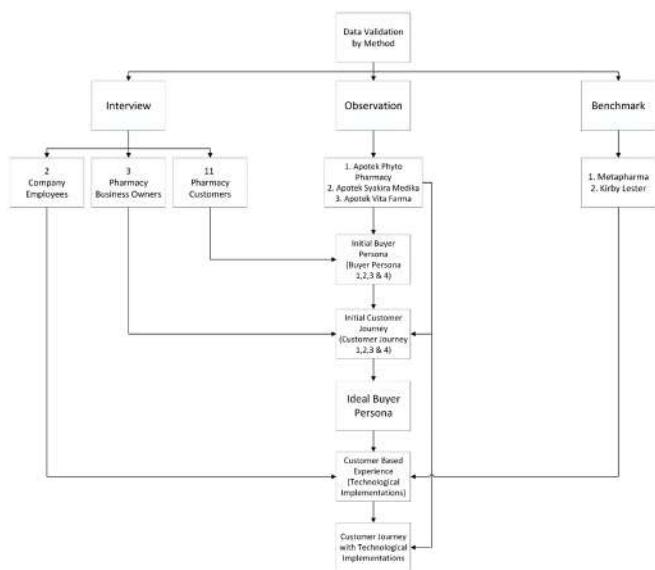


Figure 1 Triangulation Procedure

Based on the figure above, this qualitative research will be validated using the data triangulation method taken from the interview results with the company employees, business owners, and pharmacy customers, observation in three community pharmacies, and benchmark with two relevant companies' results in the development of the buyer persona and customer journey, after developing the buyer persona and the customer journey then customer based experience strategy can be implemented in this study. Therefore, the data from the triangulation is essential for developing the buyer persona and the customer journey that results in the customer-based experience strategy.

A. Customer Buyer Persona

Buyer personas are essential for comprehending customer behavior (Revella, 2015). A buyer persona is a fictional character who represents the ideal customer (Mandal and Joshi, 2017). It is a realistic picture of the best possible consumer. This information can be gathered via studying, surveying, and interviewing the target market (Mandal and Joshi, 2017). The importance of buyer persona is to grasp the consumer's interests and views, to help the study perceive them as different individuals, and provide

the best possible customer experiences, increasing brand affinity and customer loyalty (MyOperator, 2022). This study will be presented four buyer personas for community pharmacies. Below are the lists of the four buyer persona for the community pharmacy.

a. Buyer Persona 1

BUYER PERSONA	Persona 1	
	Identifiers:	Goals
	<ul style="list-style-type: none"> Tend to be more conscious about his/her healthy and live a <i>fairly healthy lifestyle</i> They are usually more loyal because they tend to stay with the same pharmacy for years (hard to convert) Concern about his health because of the old age This persona needs to have continuously treated by medicine because of the old age <p>Personality:</p> <p>Conventional and dedicated</p> <p>Hobby and Lifestyle:</p> <p>Does not understand technology and hard to learn and accept new things minimum consumption of junk food and usually more conservative</p>	<p>Getting vitamin and medicine for themselves as they need the medicine to survive</p>
	<p>Identifiers:</p> <ul style="list-style-type: none"> Pain Points (What challenges are <i>they trying to solve</i>) <p>Motivation of Going to the Pharmacy (The problem and how the pharmacy can help to solve the problem)</p>	
Age	>60	
Profession	Retired	This persona recognizes that he is needs to maintain his/her health by using vitamins and medicine. Moreover he/she are old, that is why they need the vitamin and medicine to survive and have a healthy body
Domicile	Bandung	
Monthly expenses	Tentative	
Education	Bachelor's Degree	
Concern		<ul style="list-style-type: none"> Long queue Long time to retrieve the medicine and it will take longer if the pharmacy is crowded Complicated administrative procedure The medicine that I need is unavailable The customer service is not friendly The persona <u>do</u> not understand the technology advancement that is why they tend to stay away from pharmacy that have complicated digital system The medicine price is more expensive than the other pharmacy

Figure 2 Buyer Persona

b. Buyer Persona 2

BUYER PERSONA	Persona 2	
	Identifiers:	Goals
	<ul style="list-style-type: none"> Tend to be more conscious about his/her health and live a <i>fairly healthy lifestyle</i> Concern about his health and also the people around them This persona believes it is better to prevent than to cure <p>Personality:</p> <p>Observant, diligent, open</p> <p>Hobby and Lifestyle:</p> <p>Like to do sport, tech-savvy, minimum consumption of junk food, doing exercise routinely</p>	<p>Getting vitamin and medicine such paracetamol and other OTC drug for themselves and for someone else (usually for people at their settlements in case they got sick), they also do not want spend a lot of time in the pharmacy</p>
Age	21-49	<p>Pain Points (What challenges are they trying to solve)</p> <p>Motivation of Going to the Pharmacy (The problem and how the pharmacy can help to solve the problem)</p>
Profession	College Students, Career woman	This persona recognizes that he is needs to maintain his/her health by using vitamins and supplements. Moreover he/she also worries about himself/herself if they ever get sick that is why this persona usually buy OTC drugs as an emergency medicine, they also tend to buy first aid kit for themselves and for others.
Domicile	Bandung	
Monthly expenses	Around Rp8,000,000	
Education	Bachelor's Degree	
Concern		<ul style="list-style-type: none"> Long queue Long time to retrieve the medicine and it will take longer if the pharmacy is crowded Afraid of getting infected by a disease because we do not know other customer are healthy or sick Complicated administrative procedure The medicine that I need is unavailable The customer service is not friendly The medicine price is more expensive than the other pharmacy
Consideration		<ul style="list-style-type: none"> Wide product variety and complete choice of medicine Close to the persona's settlements Clean and hygienic The availability of general practitioner for them to consult The pharmacy is well known and have a good reputation

Figure 3 Buyer Persona 2

c. Buyer Persona 3

BUYER PERSONA	Persona 3	
	Identifiers:	Goals
	<ul style="list-style-type: none"> Aware about his/her health but are not fully committed to have a healthy lifestyle Concern about the simplicity and fast service of the pharmacy Prefer to go to pharmacy that open for 24 hours This persona tends to cure rather than prevent <p>Personality:</p> <p>Diligent, get bored easily, simple</p> <p>Hobby and Lifestyle:</p> <p>Playing social media, tech-savvy, not quite healthy, some of them smoke</p>	<p>Getting medicine such paracetamol and other OTC drug for themselves and also getting doctor prescription medicine</p>
Age	19-42	<p>Pain Points (What challenges are they trying to solve)</p> <p>Motivation of Going to the Pharmacy (The problem and how the pharmacy can help to solve the problem)</p>
Profession	College Students, Employee	This persona recognizes that he is needs to maintain his/her health. However, they are not fully committed to have a healthy lifestyle, some of them buy vitamin but occasionally, they usually go to pharmacy only when they are sick or feel unwell.
Domicile	Bandung	
Monthly expenses	Rp5,000,000 - Rp25,000,000	
Education	Bachelor's Degree	
Concern		<ul style="list-style-type: none"> Long queue Long time to retrieve the medicine and it will take longer if the pharmacy is crowded Long and complicated service Complicated administrative procedure The medicine that I need is unavailable Parking cost especially if they only stay for a short period of time
Consideration		<ul style="list-style-type: none"> Complete choice of medicine Close to the persona's settlements or the pharmacy location is strategic The availability of general practitioner for them to consult Long working hours preferably 24 hours The availability of digital payments The availability of delivery service The pharmacy is well known and have a good reputation

Figure 4 Buyer Persona 3

d. Buyer Persona 4

BUYER PERSONA	Persona 4			
	Identifiers:		Goals	
	<ul style="list-style-type: none"> This persona is busy and did not care a lot about his/her health This persona tends to be more open for the use of technology and willing to learn the technology if it means make their live simple Have delivery service so when they are feeling not well they can order medicine immediately This persona tends to cure rather than prevent <p>Personality: Open, smart, simple</p> <p>Hobby and Lifestyle: Playing social media, tech-savvy, not quite healthy, like to learn new things</p>		Getting OTC drug for themselves and also getting doctor prescription medicine	
Age	18-45	<p>Pain Points (What challenges are they trying to solve)</p> <p>Motivation of Going to the Pharmacy (The problem and how the pharmacy can help to solve the problem)</p>		
Profession	College Students, Employee	<p>This persona recognizes that he is needs to maintain his/her health. However, they are not fully committed to have a healthy lifestyle, they feel work as the most important and they value fast service and simplicity</p>	The pharmacy had medicine that I need, have relatively fast service and also include delivery service	
Domicile	Bandung			
Monthly expenses	Rp10,000,000 - Rp25,000,000			
Education	Bachelor's Degree			
Concern	<ul style="list-style-type: none"> Long service time Complicated administrative procedure Digital payments are not available The medicine that I need is unavailable There is no pamphlet regarding the complete information of the medicine, especially on the ingredients of the medicine and the information about the contra indication with another substance Driver fails to articulate the needs of the customers resulting in miscommunication between the pharmacist and the customers 			
Consideration	<ul style="list-style-type: none"> Complete choice of medicine Long working hours preferably 24 hours The availability of digital payments 			

Figure 5 Buyer Persona 4

B. Buyer Persona Customer Journey

Users, prospects, and customers taking steps when interacting with a company are referred to as a customer journey. Customer journey allows for a better focused messaging, a fuller image of the potential customers for new hires, and ultimately more successful marketing; therefore, it is vital to employ customer journey (Wills, 2019). Below are the four customer journeys based on each of the buyer persona in section A.

a. Customer Journey for Buyer Persona 1

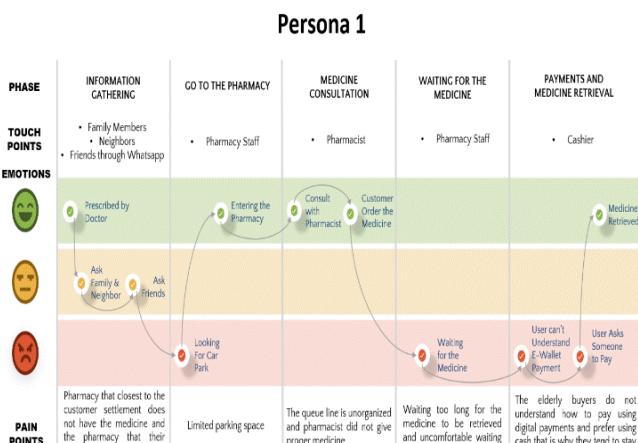


Figure 6 Customer Journey for Persona 1

The customer journey starts by the Persona 1 by being prescribed by the doctor. Persona 1 usually ask their family members and their closest neighbors after that they usually ask their friends by phone, the pain points for the customer in this phase are they tend to choose the pharmacy closest to them or go to the pharmacy that their friends recommends to them, the second phase is looking for the car park and entering the pharmacy, the pain points in this phase are limited parking space and because the persona is already an elderly it is hard for them to park their car in the pharmacy, the third phase is consulting with the pharmacist and ordering the medicine, the pain points in this phase are unorganized queue line, the next phase is waiting for the medicine, the pain points in this phase is waiting too long for the medicine to be retrieved, the next phase is payments and medicine retrieval, the pain points are the persona does not understand how to use digital payments therefore the pharmacy needs to have payments by cash.

b. Customer Journey for Buyer Persona 2

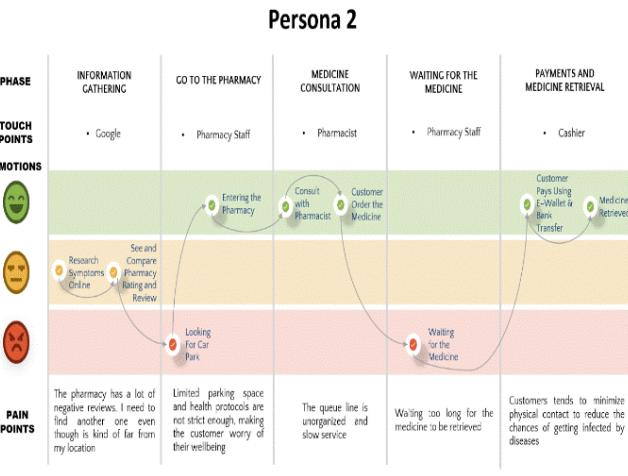


Figure 7 Customer Journey for Persona 2

The customer journey starts with Persona 2 researching the symptoms online. After they research their symptoms online, they will try to find the most suitable medicine for them after they find the medicine that they want to buy. Persona 2 usually see and compare pharmacy rating and review, the pharmacy that has a lot of negative reviews tends to be avoided by the customers, the customers also willing to go farther distance for pharmacy that have positive reviews rather than going to the closer pharmacy but have a lot of negative reviews, the second phase is looking for the car park and entering the pharmacy, the pain points in this phase are limited parking space and the health protocol are not strict enough, the third phase is consulting with the pharmacist and ordering the medicine, the pain points in this phase are unorganized queue line, the next phase is waiting for the medicine,

the pain points in this phase is waiting too long for the medicine to be retrieved, the next phase is payments and medicine retrieval, the pain points are the persona tends to minimize physical contact to reduce the chances of getting infected by diseases.

c. Customer Journey for Buyer Persona 3

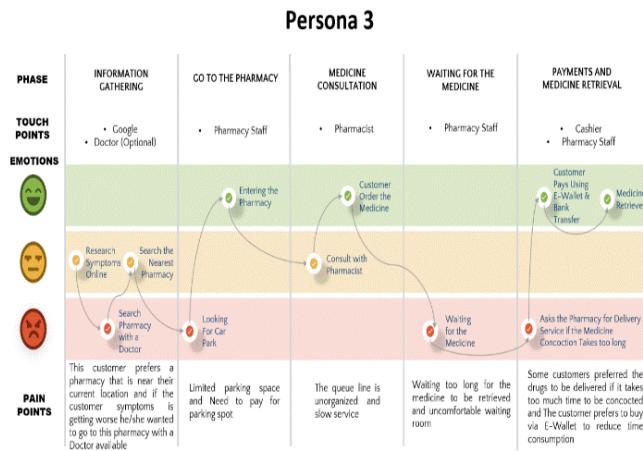


Figure 8 - Customer Journey for Persona 3

The customer journey start by the Persona 3 by researching the symptoms online, Persona 3 usually see whether there are doctor available in the pharmacy or not, this persona also tends to go to the pharmacy that are the nearest from them, the pain points for the customer in this phase are the pharmacy that tend to be far away and do not have doctor available tend to be avoided by the customers, the second phase is looking for the car park and entering the pharmacy, the pain points in this phase are limited parking space, the third phase is consulting with the pharmacist and ordering the medicine, the pain points in this phase are unorganized queue line and the uncomfortable waiting room, the next phase is waiting for the medicine, the pain points in this phase is waiting too long for the medicine to be retrieved, the next phase is payments and medicine retrieval, the pain points are this customer usually does not want to stand by at the pharmacy if the medicine is taking too long to be retrieved this persona usually want the medicine to be delivered to their settlements to avoid waiting in the pharmacy.

d. Customer Journey for Buyer Persona 4

Persona 4

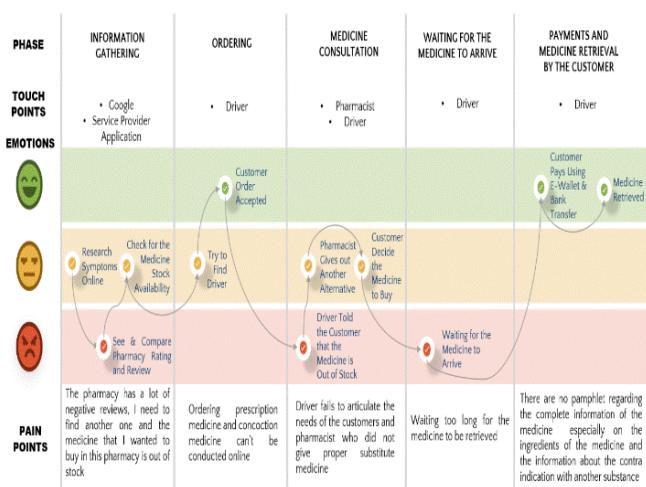


Figure 9 - Customer Journey for Persona 4

The customer journey start by the Persona 4 by researching the symptoms online they also see and compare pharmacy rating and reviews, the pharmacy that has a lot of negative reviews tend to be avoided by the customers, next phase is find the driver to help them to get the medicine, the pain points is the persona cannot order prescription medicine and concoction medicine, because it is not allowed to buy those medicine without the doctor physical receipt, the third phase is consulting with the pharmacist and ordering the medicine, the pain points in this phase is because the customer bought the medicine online the driver needs to articulate the needs of the customers and in that conversation the pharmacist might not be able to get the message from the customers because the driver may fail to articulate the message from the customers, the next phase is waiting for the medicine, the pain points in this phase is waiting too long for the medicine to be retrieved, the next phase is payments and medicine retrieval by the customers, the pain points are there are no pamphlet regarding the complete information of the medicine especially on the ingredients of the medicine and the information about the contra indication of the medicine with another substance that might harm the patient wellbeing.

IV. IMPLEMENTATION

Based on the result of the analysis of 4 buyer persona of the pharmacy, this study combines and takes the potential buyer persona the implementation of smart pharmacy in Indonesia, the process is to include buyer persona who are tech-savvy, want to learn new things and values simplicity and fast service, below are the ideal buyer persona for the implementation of smart pharmacy in Indonesia.

BUYER PERSONA			
		Identifiers:	Goals
<ul style="list-style-type: none"> This persona is busy, however they are aware about his/her health Concern about the simplicity and fast service of the pharmacy This persona tends to be more open for the use of technology and willing to learn the technology if it means make their lives simple 		Getting medicine such paracetamol and other OTC drug for themselves and also getting doctor prescription medicine	
Personality: Diligent, open to technology, simple			
Hobby and Lifestyle: Playing social media, tech-savvy, like to learn new things			
Age	18-45	Pain Points (What challenges are they trying to solve)	Motivation of Going to the Pharmacy (The problem and how the pharmacy can help to solve the problem)
Profession	College Students, Employee	This persona recognizes that he is needs to maintain his/her health. They value fast service and simplicity of some of them usually go to pharmacy only when they are sick or feel unwell.	The pharmacy had medicine that I need, the pharmacy can give additional information regarding the medicine that I buy and have relatively fast service
Domicile	Bandung		
Monthly expenses	Rp5,000,000 - Rp25,000,000		
Education	Bachelor's Degree		
Concerns		<ul style="list-style-type: none"> Long queue Long time to retrieve the medicine and it will take longer if the pharmacy is crowded Long and complicated service The medicine that I need is unavailable There is no pamphlet regarding the complete information of the medicine, especially on the ingredients of the medicine and the information about the contra indication with another substance 	
Consideration		<ul style="list-style-type: none"> Wide product variety and complete choice of medicine The availability of general practitioner for them to consult The availability of digital payments The availability of delivery service The pharmacy is well known and have a good reputation 	

Figure 10 Buyer Persona for Smart Pharmacy in Indonesia

From the current buyer persona for pharmacy in Indonesia, then this study can create the customer journey and the pain points that the customer feels for the current pharmacy in Indonesia, in this section also, will be explained furthermore about the technological implementation to tackling the customer's pain points in the information gathering phase, go to the pharmacy phase, waiting for the medicine phase and the payments and medicine retrieval phase of the current pharmacy in Indonesia, below are the customer journey with the technological implementation for smart pharmacy in Indonesia.

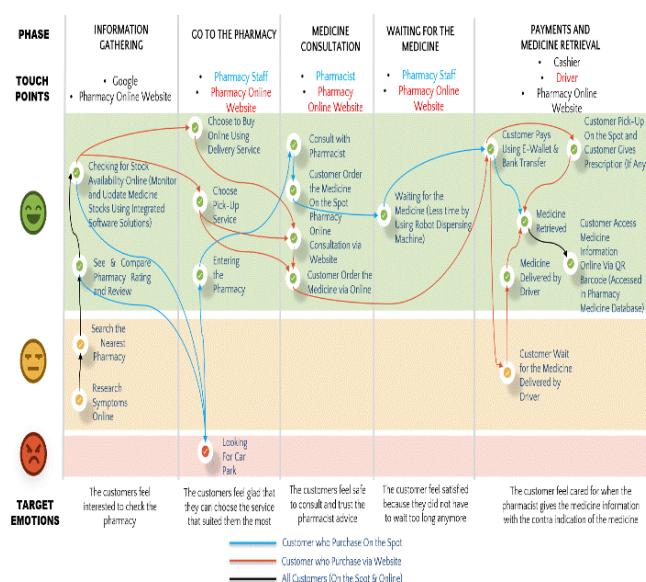


Figure 11 - Customer Journey for Smart Pharmacy in Indonesia

Based on this study, the customer journey should be divided into two paths to create smart pharmacies in Indonesia with the ideal buyer persona. This study shows that customers prefer to buy online or on the spot. The customer journey was designed with technological implementation plans to solve the customer pain points in each phase. This study has compiled the solution for the pain points in each phase. The solution is as follows.

A. Information Gathering Phase

the customer prefers a pharmacy that updates their medicine stocks daily so the customers can know whether the medicine they want to buy is available or not. The pain point for this customer is when they decide to go to the pharmacy, the medicine in the pharmacy is out of stock. The solution is to create an integrated software solution for the pharmacy to facilitate effective medicine inventory management and tracking, so the customer can check the stock availability while ordering online or offline other than that, software solutions can also be utilized to create paperwork, monitor supply, stock tracking and order processing. Below are the primary uses for using IT solutions in the pharmaceutical industry.

One of the companies that provide this kind of service is Meta-Pharma. Meta-Pharma provides a fully integrated ERP system based on Microsoft Dynamics 365 Business Central and created exclusively for the pharmaceutical industry to meet compliance requirements. Moreover, it automates all the essential operations, including planning, procurement, inventory, production, and business intelligence. In this manner, the Meta-Pharma ERP solution for Pharmaceuticals. Below is the illustration of the ERP business process by Meta-Pharma (Meta Option, n.d.) Enterprise-level, an all-in-one solution suitable for manufacturers, logistics, medicines, wholesalers, and distributors. Meta-Pharma product called MetaWMS Advanced Warehouse Solution is an extension for Dynamics 365 Business Central that provides unprecedented visibility and control over the warehouse operations using industry-leading best practices, such as intelligent pick and pack processes, handheld 1D/2D barcode scanning, label printing, inventory counts, and integration with shipping systems, reporting, and invoicing, to run the warehouse more efficiently and reduce handling costs. As a fully integrated system with Business Central, the pharmacy firm will have real-time access to accurate inventory data, warehouse professionals to save time locating items and performing physical inventories, sales representatives can monitor stock availability, and buyers can maintain optimal stock levels while minimizing costs. Both systems are very adaptable to the changing needs of the expanding business (Meta Option, n.d.).

B. Go to The Pharmacy Phase

the pain points are limited parking space and the need to pay for a parking spot. The solution is to create a pick-up service for medicine to solve the customer pain points, which is the need to pay for a parking spot by estimating medicine concoctions and providing an on-demand delivery service. The other benefit to this solution is avoiding queues inside the pharmacy.

One of the companies that provide this kind of service is Upper Route Planner. Upper Route Planner is route planning and optimization software designed to assist small and medium-sized enterprises in managing and streamlining daily delivery operations. Upper Route Planner software has been intended to remove the confusion of manual route planning and help the company to scale the business more profitably by providing the pharmacy firm with optimum routes and turn-by-turn driving directions because by using Google Maps or Waze, it is challenging to lay out several stops on a single delivery route. Maps by Google limits the number of stops per route to ten. Neither does it optimize routes to save time when driving. Additionally, it cannot accommodate many delivery drivers simultaneously. On the other hand, using technologies like Upper Route Planner, the pharmacy firm can significantly improve the ability to deliver prescription medications on schedule (Rakesh Patel, 2022).

C. Waiting for The Medicine Phase

In the waiting for the medicine phase, the customer needs to wait too long for the medicine to be retrieved, and it is an uncomfortable waiting room. The solution is to use a Fully Automated Prescription Filling Robot to reduce time consumption in waiting for the medicine.

One of the companies that have developed the product is Kirby Lester. Kirby Lester has been a pioneer in the community pharmacy automation industry, earning the reputation of being the most reliable name in the industry. Whether it is a local community pharmacy, a regional grocer, a national pharmacy chain, the outpatient pharmacy of a large hospital system, or even high-speed/high-volume central fill operations, Kirby Lester provides the systems to efficiently manage prescription filling, keep the controlled substances secure, and streamline workflow.

D. Payments and Medicine Retrieval Phase

To tackle the problem of medication error and to solve the customer pain point in this phase regarding the unavailability of the pamphlet that contains complete information about the medicine, especially on the ingredients of the medicine and the information about the contraindication with another substance it is recommended for the pharmacy firm to create a database containing the

medical information of the medicine ingredients and the contraindication with another substance, this can be done by providing a barcode where the customer can scan to access the information regarding the medicine, the facility should be designated specifically for, and that specializes in, the information regarding drugs and other matters related to them.

One company that provides this service is Drugs.com, Drugs.com, a website devoted to medical topics found on the internet. The company's mission is to become the most reliable source of knowledge about medicines and other aspects of health that can be found on the internet. This goal will be accomplished by providing unbiased, impartial, thorough, and up-to-date information in an understandable format for consumers and healthcare professionals.

The purpose of the service is to provide genuine, individualized, accurate, relevant, and unbiased drug information to consumers and healthcare professionals regarding medication-related inquiries to the nation for health care and drug safety aspects by answering their call regarding the crucial problems on drug information, their uses, and their side effects. This information is intended to benefit the patients regarding health care and drug safety (Drugs.com, 2018).

V. CONCLUSION

This study aims to develop a customer-based experience of a smart pharmacy to implement a smart pharmacy in Indonesia. This study uses 4 data sources to determine the customer journey's implementation and the ideal buyer persona. The data sources, namely data from interviews of 11 customers, observations, and data interviews of 3 business owners, are gained from the interview and observation methodology. These data sources are used for developing the buyer persona and customer journey. This data source resulted in 4 buyer personas and four customer journeys. Data from benchmarking with another company help the author with the implementation plan for the development of smart pharmacy in Indonesia by comparing the technology that they have and resulting in technological implementations that might be beneficial for the development of smart pharmacy in Indonesia. Based on the result of the analysis of 4 buyer persona, the process is to include buyer persona who are tech-savvy, want to learn new things and values simplicity and fast service, thus gaining the target buyer persona ideal for the implementation of smart pharmacy, the customer journey then developed from this buyer persona with relevant technological implementations that have been gained from the benchmarking data, the result is the customer journey should be split into two paths to develop a smart pharmacy in Indonesia with this ideal

buyer persona. As to this study, the customers prefer to buy either online through the website or on the spot based on customers' needs. The customer journey was designed with the technological implementation plans with the consideration that it must be able to solve the problems and pain points felt by customers, have not been implemented, or are different from other traditional pharmacies in Indonesia, and focus on technology. Thus, this study can provide useful data for developing smart pharmacies in Indonesia.

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Paper 14

Understanding the Role of Environmentally Friendly Lifestyles on Consumer Shopping Behavior at Bulk Stores

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Abstract – Environment-friendly revolution in both mindset and lifestyle have become a concern among the society including business owners. This can be seen through the existence of bulk stores which are perceived to have a strong potential to intervene in people's lifestyles in the future. This study aims to examine the influence of environmental knowledge, environmental lifestyle, environmental reputation, and environmental advertisement on consumers' shopping behavior towards bulk stores in Indonesia. This research employed a quantitative approach by using a non-probability sampling technique (purposive sampling) with a sample of 207 respondents from bulk store consumers in Indonesia. Using Partial Least Square as the data analysis technique, the result of this study indicates that environmental knowledge and environmental lifestyle have no significant effect on consumers' shopping behavior in bulk stores. In addition, environmental reputation and environmental advertisement significantly determine consumer behavior in shopping at bulk stores in Indonesia.

Keywords – Advertisement, Bulk Store, Environmental, Knowledge, Lifestyle, Shopping Behavior

I. INTRODUCTION

Environmental problems have become global-scale issues that are of concern to many parties. One of the problems that many are trying to tackle, which is the responsibility of many parties, is the waste problem [1]. Household garbage has become the result of the modern consumer lifestyle. Nowadays, Indonesia occupies the second position as the largest waste producer in the world after China [2]. Furthermore, the government and consumers are aware of environmental problems [3]. In Indonesia, the government has set regulations regarding this matter. One of them is Governor Regulation 142 of 2019 concerning the Obligation to Use Environmentally Friendly Shopping Bags at Shopping Centers, Supermarkets, and People's Markets organized by the Jakarta Provincial Government [4]. In addition, the government frequently campaigns for encouraging revolution in people's mindsets and lifestyles to be more environmentally friendly [5]. A product, service, laws, guidelines, and policies considered not harmful to the environment are called environmentally friendly. Environmentally friendly has several other names: eco-friendly, green, environmental, and nature friendly [6]

One of the environmentally friendly social movements now becoming known and being widely discussed is the "Zero Waste" movement. This movement had become a trend in the past and had been popular in developed countries, however, now environmentalist organizations are socializing the zero-waste movement in Indonesia. According to Zero Waste Indonesia, zero waste is a philosophy used as a lifestyle to encourage the life cycle of resources so that products can be reused. The "5R" principle serves as a guideline for the zero-waste concept which stands for "Refuse" (refusing) which means refusing to use products that have the potential to become waste that can damage the environment, "Reduce" means reducing the use of products that are not needed and have the potential to become waste products. waste, "Reuse" (reusing) i.e. reusing and optimizing the benefits of products that can be used many times so as not to become disposable items that will become waste, "Recycle," i.e. recycling waste so that it can become a new product that can be reused/reused, as well as "Rot" (decomposing waste) which uses specific techniques so that organic products can be decomposed entirely and the result can be composted to fertilize the soil [7].

Government policies and environmental care movements can provide education in terms of environmental knowledge and form public awareness of the dangers of climate change threats that occur because of what is used and consumed daily. Environmental knowledge refers to individual knowledge about the environment and pressing issues, such as climate change, deforestation, and marine pollution due to non-biodegradable waste [8]. According to several studies, environmental knowledge can affect consumers' shopping behavior [9][10][11]. Consumers' shopping behavior is a consumer's concern for the environment in terms of searching, buying, using, evaluating, and disposing of the products used [12].

With the increase in environmental knowledge, environmental lifestyle will increase because many people are starting to embrace a zero-waste lifestyle. Environmental lifestyle is an individual's time spent doing activities about the environment, energy-saving behavior, and household consumption in general [13], [14]. Environmental lifestyle can affect consumers' shopping behavior. One of the shopping places that have adopted an environmental-friendly concept is a bulk store [14] [15] [16].

A bulk store, or, in Indonesian, can be interpreted as a wholesale store, is a grocery store with a zero-waste concept. Like grocery stores, bulk stores sell people's daily needs such as groceries, personal care, and other household needs. The difference and privilege compared to grocery stores, in general, is that bulk stores do not package their products with plastic. Buyers are required to bring their containers or containers in the form of reusable shopping jars and bags. The payment system in bulk stores is also unique because product prices are determined per unit weight (grams) for solids (grains, cereals, nuts, spices, etc.) and volume (liters) for liquids (shampoo, jam, etc.) oil, honey, floor cleaning soap, etc.) This is because the products sold do not have packaging. Such a system benefits buyers because buyers are free to determine the number of portions of the product they want or need while reducing the possibility of food waste. Examples of bulk stores in Indonesia are Alang Alang Zero Waste Store, Mamaramah Bulk Store, Zero Waste Bali, and Zero Waste Nusantara.

Environmental knowledge and environmental lifestyle are intra-personal factors, namely internal and personal factors of consumers concerning consumers' shopping behavior in bulk stores [17]. On the other hand, there are retailer-based contextual factors, namely external factors from the bulk store marketing technique, influencing consumers' shopping behavior. Retailer-based contextual factors in question are environmental reputation and environmental advertisement. The company's environmental (green) reputation is the consumer's evaluation of the company's green concept. Reputation will be formed over time based on direct experience with the company and any communication from the company that can provide information to consumers about the company's actions on the environment [18] and has a positive influence on consumers' shopping behavior [19], [20]. The bulk store itself has the principle of 3P, which can increase the company's environmental reputation in the eyes of consumers. The 3P principle, for People, refers to company employees and the community by teaching skills and providing fair wages. There is a planet where the company's operational activities do not harm the environment. Then there is Profit, namely financial benefits so that the company can continue to grow [21]

In line with the environmental reputation built by the bulk store, the bulk store also has environmental advertisements. Advertisements are usually classified into two ways: in-store advertisements (packaging design, display stands, lighting, store layout, bags, or shopping carts) and out-of-store advertisements (virtual catalogs, email, advertisements on the Internet, television, and radio) [22]. Advertisements carried out by bulk stores are mostly done on social media such as Instagram by creating Instagram Stories, and IGTV that can convey

information about the products sold and activities carried out by bulk stores to consumers [23], [24].

This study focuses on consumers' shopping behavior towards bulk stores in Indonesia, where the number of bulk stores is still limited, and the number of consumers who shop for bulk stores is still relatively small [25]. However, the existence of bulk stores has now been accepted by the public. It has even become a trend among people who have concern for the environment and have the potential to dominate people's lifestyles in the future. [26]. This study aims to see and test whether environmental knowledge, environmental lifestyle, environmental reputation, and environmental lifestyle influence consumers' shopping behavior towards bulk stores in Indonesia.

II. METHODOLOGY

This research was conducted in quantitative approach to examine the relationship among variables. For research sample, we involved consumers who live in Indonesia aged at least 17 years old and have shopped at bulk stores in Indonesia at least once through direct or online purchases. The sampling technique in this study is non-probability sampling with purposive sampling. The respondents of this study were 207 respondents. This amount is considered sufficient when viewed from the number of indicators using the formula from [27].

In addition, for data collection method was a survey with a questionnaire instrument. The survey was conducted indirectly by distributing questionnaires online using an online form link to consumers in several bulk stores in Indonesia. The questionnaire itself is divided into several parts. The first part is the opening which contains the introduction and explanation of the purpose and objectives of distributing the questionnaire. In the second part, respondents will be filtered whether they have ever shopped at a bulk store and are over 17 years old. The third part is the identity of the respondent. In this section, there are questions about the respondent's identity, such as the gender and age. The fourth part is statements about research variables. There are seven statements to measure environmental knowledge [17], [28], eight statements to measure environmental lifestyle [14], [28], and four statements each to measure environmental reputation and environmental advertisement [17], [29]. The variables of consumers' shopping behavior towards bulk stores were adopted from the measurements used by [30]. Furthermore, this study used a Likert scale to measure respondents' perceptions, attitudes, and opinions of bulk stores in Indonesia. The form is statements measured using a Likert scale of 1-5.

In addition, this study employed PLS (Partial Least Square) analysis method. The PLS-SEM analysis technique

tests the relationship between variables that cannot be measured directly but are measured by indicators of each of these variables [27]. PLS-SEM is appropriate to analyze a small sample size considering that the number of bulk store consumers in Indonesia is still limited. There are two stages of testing that need to be carried out in PLS, namely outer model evaluation and inner model evaluation. The outer model is carried out to test the validity and reliability of each variable indicator. In contrast, the inner model is carried out to test whether there is an influence between variables by looking at the R² test value and the path coefficient. The software application used to process the research data is SmartPLS 3.0.

III. RESULTS

By analyzing at the characteristics of the respondents, we have found that most respondents are aged 17-24 years (46.85%), female (81.64%) and domiciled in the city of Surabaya (40.09%). Alang-Alang Zero Waste Store and Zero Waste Bali are the most visited bulk stores with the same number of 36 respondents with 17.39%. Furthermore, most respondents have shopped at bulk stores at least 2-5 times by 48.30% and more than five times by 18.84%.

The inner model test result shows that the indicators used in this study have met convergent validity. The outer loading value of each indicator item and the AVE value for each latent variable is more significant than 0.5. The outer loading ranges for the variables Environmental Knowledge (EK), Environmental Reputation (ER), Environmental Lifestyle (EL), Environmental Advertisement (EA), and Consumers' Shopping Behavior towards Bulk Store (CB) are respectively 0.765 - 0.864; 0.633-0.805; 0.764-0.853; 0.746-0.846, and 0.868-0.886. Each correlation of latent variables and indicators also has a value greater than the value of other latent variables, so it has met the requirements of discriminant validity. This can also be seen from the AVE root value in the Fornell-Larcker Criterion test in Table 2. It means that the indicator items used are correct in measuring the variables.

The requirements for the consistency of research respondents' answers have also been met with Cronbach's alpha and composite reliability values of more than 0.7 each to be reliable [31]. This high value indicates that the data in this study can be trusted even though it has been measured many times.

Table 1 - Measurement Model Evaluation

Item	Outer Loading	Cross Loading	AVE	Cronbach's Alpha	Composite Reliability
Environmental Knowledge (EK)					
EK01	0.853	0.853	0.629	0.902	0.922
EK02	0.764	0.764			
EK03	0.822	0.822			
EK04	0.772	0.772			
EK05	0.768	0.768			
EK06	0.807	0.807			
EK07	0.764	0.764			
Environmental Lifestyle (EL)					
EL01	0.633	0.633	0.546	0.881	0.905
EL02	0.737	0.737			
EL03	0.756	0.756			
EL04	0.693	0.693			
EL05	0.748	0.748			
EL06	0.791	0.791			
EL07	0.735	0.735			
Environmental Reputation (ER)					
ER01	0.814	0.814	0.669	0.834	0.890
ER02	0.827	0.827			
ER03	0.864	0.864			
ER04	0.765	0.765			
Environmental Advertisement (EA)					
EA01	0.746	0.746	0.632	0.806	0.873
EA02	0.812	0.812			
EA03	0.846	0.846			
EA04	0.773	0.773			
Consumers' Shopping Behavior towards Bulk Store (CB)					
CB01	0.878	0.878	0.767	0.899	0.929
CB02	0.868	0.868			
CB03	0.886	0.886			
CB04	0.871	0.871			

Table 2 - FORNELL-LARCKER CRITERION

Variable	CB	EA	EK	EL	ER
CB	0.876				
CB	0.730	0.795			
CB	0.601	0.651	0.793		
CB	0.496	0.500	0.471	0.739	
CB	0.672	0.708	0.734	0.464	0.818

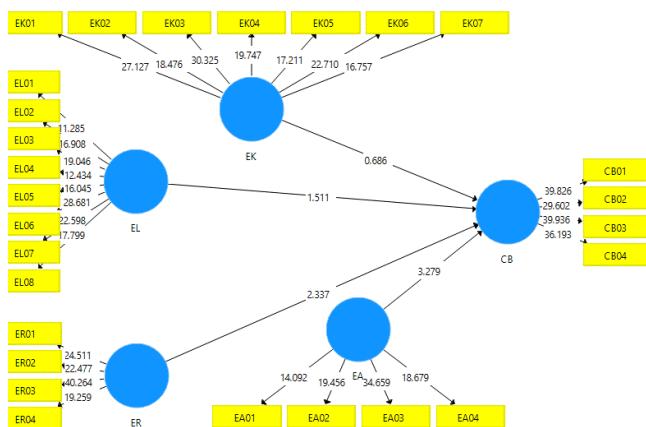


Fig. 1 Inner Model Evaluation

This model is good at measuring the variation in the value of the environmental knowledge, environmental lifestyle, environmental reputation, environmental advertisement, and consumers' shopping behavior towards bulk store variables. This can be seen from the R² value of 0.597, which indicates the significant contribution given by the environmental knowledge, environmental lifestyle, environmental reputation, and environmental advertisement variables to consumers' shopping behavior towards the bulk store, which is 59.7%. This value is greater than zero, which indicates that this model has predictive relevance and is well reconstructed. Other factors outside the model explain the remainder of R² of 0.403 (40.3%).

Table 3 - INNER MODEL TESTING RESULT

Hypothesis	Path Coefficient	T Statistics	p-Values
(H1) EK -> CB	0.069	0.721	0.471
(H2) EL -> CB	0.125	1.545	0.123
(H3) ER -> CB	0.246	2.364	0.018
(H4) EA -> CB	0.449	3.453	0.001

Based on the data in Table III, the path coefficient value shows that the environmental knowledge and environmental lifestyle variables have no significant effect on the consumers' shopping behavior towards the bulk store variable. Meanwhile, environmental reputation and environmental advertisement variables significantly positively affect consumers' shopping behavior toward the bulk store. Based on the T-statistic and p-value, the first hypothesis (H1) and second hypothesis (H2) were not supported, while the third hypothesis (H3) and fourth hypothesis (H4) were accepted.

IV. DISCUSSION

The results of this study prove that the environmental knowledge variable does not affect the shopping behavior of bulk store consumers in Indonesia. The T-statistic value

for the environmental knowledge of the bulk store variable is 0.721 (<1.96) and the p-value is 0.471 (>0.05). Here, environmental knowledge of bulk stores does not yet have a strong influence on consumers' shopping behavior towards bulk stores, so the first hypothesis (H1), namely "Environmental knowledge of bulk stores influences consumers' shopping behavior towards bulk stores," is rejected.

The results of this study are not in line with several previous studies which stated that environmental knowledge is a substantial factor in influencing pro-environmental behavior in buying environmentally friendly products. The respondents already have good environmental knowledge if seen from the total mean of environmental knowledge of bulk store variables, which is 4.38, categorized as very high. However, respondents' knowledge of the environment may not necessarily influence their shopping behavior in bulk stores. Respondents' knowledge that shopping at bulk stores impacts the environment and prevents climate change has not been able to provide satisfaction for respondents when shopping at bulk stores. It has not been able to make respondents say good things about bulk stores. This may happen because there are other more influential aspects, such as the reputation and services the bulk store provides. [9] revealed that this could also be influenced by attitude namely how respondents respond to this knowledge and whether this knowledge will make respondents more concerned about their environment or even ignore it.

This difference in results could also be because this study was conducted in different locations. Previous research was conducted in developed countries such as China and countries on the European continent such as Spain and the UK, where these respondents have had extensive knowledge government education regarding the environment has been carried out for a long time because it has become the focus of problems in the country [10], [28], [32], [33]. However, the results of this study are in line with the research of [17], which states that environmental knowledge does not affect consumer behavior when examined grocery store consumers who use the concept of sustainable packaging in Vietnam, where the country is a country in Southeast Asia and is still a developing country whose conditions are not much different from Indonesia.

Environmental lifestyle is also proven not to affect consumers' shopping behavior towards bulk stores. The T-statistic value for the environmental lifestyle variable is 1.545 (<1.96) and the p-value is 0.123 (>0.05). This means that respondents who prioritize the environment as their lifestyle cannot make the respondents feel satisfied with the bulk store. Respondents who often discuss environmental issues, think about recycling, and reduce

household energy and water use do not necessarily encourage shopping at bulk stores. This differs from previous studies, which revealed that lifestyle could affect how consumers shop and choose the goods they need [17]. This difference can occur due to differences in respondents' encouragement in adopting a lifestyle, such as moral reasons for a sense of responsibility to the environment [34]. In Indonesia, this kind of lifestyle is still a new thing. In other countries, such as China, this kind of lifestyle has become an essential part of people's daily lives because the problems of pollution and human overpopulation (population explosion) in that country are of great concern [28]. This lifestyle is supported by adequate technology.

Differences in the results of this study can also be observed from the research object. [16] conducted a study of consumers who buy clothing products where the clothing itself is an item that can be used repeatedly and has a long-life span. Meanwhile, this research was conducted in bulk stores where most of the products sold are organic. However, the results of this research support several other studies which state that environmental lifestyle does not yet have a strong enough influence on consumer behavior [15], [35]. Newton and Meyer's research revealed that lack of knowledge on how to find daily necessities products to support an environmental lifestyle is one of the main problems. This situation is similar to Indonesia, where there are very few bulk stores and the distribution is uneven.

Environmental reputation significantly affects the variables of consumers' shopping behavior toward the bulk store. The total mean value of the environmental reputation variable is 4.39, with a very high category proving that the bulk store has been considered to have a good reputation in the eyes of the respondents so that respondents feel satisfied when shopping at the bulk store. Respondents' satisfaction with the concept of "packaging-free" in shopping at bulk stores significantly affects their satisfaction, so they say good things about bulk stores and recommend their relatives and friends to shop at bulk stores. Companies with an environmental reputation in carrying out good environmental management and responsibility will get many benefits such as more optimal company resources, improved corporate image in the eyes of the public, known to be obedient to state laws, and other competitive advantages such as increased sales. These will eventually lead to consumers' shopping behavior [17], [19], [20], [36], [37].

Bulk stores in Indonesia already have good environmental advertisements to attract consumers' attention to shop at bulk stores. Respondent's interest in marketing techniques such as advertisements carried out by bulk stores on social media regarding their commitment to the concept

of "packaging-free" shopping is a motivating factor for respondents to shop at bulk stores. This study is in line with previous research, which found that environmental advertisements are very influential in guiding consumers in China in shopping [38], [39]. In addition, creative environmental advertisements can attract consumers. Interest in a product will create curiosity and affect consumers' purchase intentions [22], [40]. Environmental advertisement in this study has the most significant influence in this research model, which is 44.9%.

V. CONCLUSION

Environmental reputation and environmental advertisement determine consumer behavior in shopping at bulk stores in Indonesia. Companies or business owners of bulk stores need to understand more deeply from the consumer side their perceptions and preferences for bulk stores to improve an environmentally friendly corporate image. Companies need to announce their competitive advantages to the public, including policies related to the environment, which can then improve a good image in the eyes of the public. For example, bulk stores must continue to be committed to packaging-free. This can be the identity of the bulk store that distinguishes it from other stores. Bulk stores can also take advantage of their website and social media by creating engaging social media marketing activities on an ongoing basis to attract people's attention. On the other hand, the government also needs to continue campaigning for this environmental-friendly concept so that people continue to be educated to have knowledge of the environment and make it part of their lifestyle. People with an environmental-friendly lifestyle tend to shop at bulk stores.

In the future, further research can develop research topics by selecting other populations and samples and using a larger number of samples so that they can be generalized better or more specific. Other aspects can also be included to examine what factors influence the buying behavior of bulk store consumers, such as service and socio-demographic (gender, income, education, psychology, and culture).

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Paper 15

The Analysis Of Purchase Intention Towards Customer Decision In Dental Clinic

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Abstract - Dental service has become the most important role in the marketing strategy of a clinic. To be able to compete with the dental clinic, the researcher suggested implementing the 7Ps strategy. The desire of the community in caring for dental and oral health in the city of Bandung is still relatively low. Comfort Smile plans to open a dental clinic in Bandung, but they do not know about a market survey regarding the condition of customers, what type of dental clinic customers will choose and what attributes can influence customers to choose a dental clinic in Bandung. Therefore, this study aims to determine which attributes most dominantly influence customers to have intentions at the dental clinic. The target respondent will be addressed to people aged 18-44 years who live in Bandung. This research will discuss consumer behaviors in terms of dentist patients to find out what influences customers to choose dental clinics. From the results of research conducted by the author, the most dominant factor is the people factor. This research also provides several recommendations to increase purchase intention and purchase decision for the dental clinic in Bandung.

Keywords - Dental clinic; 7ps Marketing Mix; Customer Intention; Customer Decisio

I. INTRODUCTION

Based on the Indonesian Medical Council (KKI) in 2020, the number of doctors who have opened dental clinics to date has reached 199,680 doctors. Then, there are 37,194 dentists and 3,974 specialist dentists. This condition has resulted in many dentists opening dental clinics. So that dental clinics are increasingly competing to get patients. Therefore, dentists must provide good service and be able to attract customers.

Dental service is anything that can be offered to a client to satisfy a desire or need. The dental service has become the most important role in the marketing strategy of a clinic, since it is the direct way to satisfy the needs of the client and create the relationship with the client (Al Mugeiren and Al Sanea, 2018). Dental clinics attract patients by improving their services based on the results of analyzing patient satisfaction levels and understanding the limitations, opportunities, and dangers associated with healthcare. It is very important for dental clinics to identify the main aspects that affect patient satisfaction and to improve the quality of their dental services. (Chang

and Chang, 2013).

Having a private clinic or a dentist is certainly not easy, dentists are expected to be able to implement the marketing function properly, in accordance with the applicable code of ethics, and be able to compete in a healthy manner.(Yusiana, 2020)

In marketing, services are defined as economic activity performed by one party for the benefit of another. The primary goal of service supply is to please the customer, consumer, or recipient. To be able to compete with the dental clinic, the researcher suggested implementing the 7Ps strategy. The marketing mix is a collection of marketing instruments used by a firm to carry out a marketing plan in order to elicit a favourable reaction from the target market. The 7Ps are the instruments of the marketing mix for services: product, place, price, promotion, people, process, and physical evidence. Dental professionals must grasp the theory and practice of marketing techniques in order to be effective practitioners. The seven "Ps" of service marketing may be used effectively to successfully promote dental services.(Dobros and Katsaliaki, 2017)

Marketing mix is an important role in financial organizations' market decisions and assessments, therefore marketing mix or marketing strategy is a mixture of vital components for planning and executing the whole marketing operational process. The applied definition of marketing mix in order to obtain a favourable position in the target market is described as presenting the proper product, in a convenient place, at a reasonable price, and at a reasonable time.

The desire of the community in caring for dental and oral health in the city of Bandung is still relatively low. The low desire of the public to visit the dental clinic is triggered by the number of dental clinics that do not match the attributes desired by the patient. Community reasons come to health services because of toothache. About 66.2% Some of them are caused by cavities. Number of people who come, only 35% of the people do new treatments, 65% of the people choose to treat and treat themselves.

Comfort Smile is a clinic that was established in 2009. Comfort Smile provides dental care which includes filling front teeth, root treatment, tooth extraction for children, tartar, comfort smile PGD (Adult Tooth Extraction)

comfort smile PGB (Back Teeth Filling), teeth whitening, and dentures. Comfort Smile is located in Bogor City, West Java and has three branches.

Because Comfort Smile will open a dental clinic branch in Bandung, they want to know what 7Ps are suitable for people who live in Bandung, whether they are the same as the dental clinic branch they have established before or different. This study also wants to know which factors have the most significant influence on consumer intentions and consumer decisions at a dental clinic in Bandung.

Comfort Smile plans to open a dental clinic in Bandung, but they do not know about a market survey regarding the condition of customers in Bandung. Comfort smile also does not know what type of dental clinic customers will choose in Bandung and what attributes can influence customers to choose a dental clinic in Bandung. Therefore, this study aims to determine which attributes most dominantly influence customers to have intentions at the dental clinic. And also this study aims to determine the relationship between consumer intentions and consumer decisions at a dental clinic in Bandung. The purpose of this research is to understand and analyze the marketing mix and its influence on consumer intentions and determine the right marketing mix. The research variable is the 7P marketing mix, namely product, price, place, promotion, people, process and physical appearance. It has a partial or simultaneous influence on consumer intentions. In marketing, the company must create the right factor steps in the form of a strategy that is based on the factors of the marketing mix. Marketing activities are an interconnected process as a system. (Indriyati, Daryanto and Oktaviani, 2018)

II. METHODOLOGY

The researcher uses a mixed method approach by combining data collection methods from quantitative and qualitative data. This research uses data analysis using a qualitative approach with semi structured interview to gain an additional insight about which factors are the most dominant to influence customers to have intention in a dental clinic and what factors influence customer decision to dental clinic to compare with factors variable that the author will use from the previous study. The interview result will be manually coded and validated using the triangulation technique. After conducting qualitative research, the author will check the triangulation with the data source method and if the triangulation check is accepted, the author will update the previous hypothesis. Then this research also uses data analysis using a quantitative approach with an online survey. The quantitative data will be collected by distributing an online questionnaire through Google Form, which will be analysed using the PLS-SEM method through the SmartPLS software. The

seven-point Likert Scale is applied in the questionnaire to assess the respondents' degree of agreement towards several hypothetical situations.

After the datas are analysed, the researcher is able to accept or reject hypotheses and clarify the findings from previous studies, as well as present discussion to generate conclusions for the current research and provide recommendations for further research. For the final section of this research, conclusions and recommendations are provided in the research to accumulate the entire research from the beginning until the end. It presents the research findings through the datas that have been collected and analysed, makes clear the research limitation, as well as formulates recommendations for further research.

III. RESULTS

As previously discussed, the author will collect data and analyze data using the qualitative method, more precisely by using the semi-structured interview method. The interview is carried out by WhatsApp video call or zoom. The author has interviewed 14 respondents, the respondents gave answers according to the author's need. For the author, data through this qualitative method is enough to reach saturation where the answers from the responses continue to discuss the answers. The author considers that the data from the respondents is sufficient to analyze the factors that influence customer to have intention in a dental clinic and factors that influence customer decision to dental clinic. In conducting research with the qualitative method, the authors found 7 respondents from Generation Y and 7 respondents from Generation Z. This means that data from respondents are valid to use because they already fulfilled the criteria which unit analysis for this research is Generation Y and Z.

To facilitate the research of the average, then made an interval. In this study, the authors determine the number of interval classes of 5 (five). The formula used according to Sudjana, 2011.

$$\text{Interval class length} = \text{Range} / \text{number of interval classes}$$

Range = Maximum score – Minimum score

Number of class intervals = 5

Based on the above formula, the length of the interval class is:

$$\text{Interval class length} = (5-1)/5 = 0.8$$

Table 1 - INTERVAL ANALYSIS

Interval	Variable X
100 - 180	Very Low
181 - 260	Low
261 - 340	Moderate
341 - 420	High
421 - 500	Very High

Based on the results of interviews, the people variable customer wants to a dental clinic that are excellent at serve customer excellent, friendly, communicative, not hesitate to answer customer questions, senior doctor, and already known by people. While the result of the highest mean descriptive analysis in the people variable is the indicator X1.4 (4.787) with statement "It is important that a dental clinic service has a dentist and staffs are reliable", second is X1.3 (4.765) with statement "It is important that a dental clinic service has a dentist and staffs are communicative so they can build good relationships with patients", and the rest are (X1.2) It is important that a dental clinic service has a dentist who looks professional and neat and X1.1 (4.700) with statement "It is important a dental clinic has senior or specialist dentist". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the price variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

A. Price

Based on the results of interviews, the price variable customer wants a dental clinic that pay the bill depends on the treatment. According to the results of the interview, they gave the maximum price they will pay for each treatment of IDR 500,000 according to the results of quantitative data with 250 respondents, the majority of respondents will at least spend IDR 100,000.00 - IDR 500,000.00 on the dental clinic. While the result of the highest mean descriptive analysis in the price variable is the indicator X2.6 (4.654) with the statement "It is important dental clinic that set prices according to the services provided". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the price variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

B. Product

Based on the results of interviews, the product (service) variable customer wants a dental clinic that are maintaining health and beauty aesthetics, able to carry out treatment properly and correctly, service provided

excellently, prioritizes cleanliness, and all treatments can be done at the dental clinic (from extraction to surgery) while the result of the highest mean descriptive analysis in the product variable is the indicator X3.2 (4,828) with the statement " It is important dental clinic that cares about hygiene (place, tools, doctor) and aesthetics during and after treatment", second is X3.1(4,729) with the statement "It is important dental clinic that treats the whole range of dental conditions", and third is X3.5 (4.446) with the statement "It is important dental clinic that have x-rays for dental treatment". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the product (service) variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

C. Promotion

Based on the results of interviews, the promotion variable customer wants a dental clinic that is get a discount on the next treatment, while the result of one of the mean descriptive analysis in the promotion variable is the indicator X4.2 (4.442) with the statement "It is important dental clinic that offers promos for every treatment". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the promotion variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

D. Place

Based on the results of interviews, the place variable customer wants a dental clinic that the area can be reached by public transportation, located in a residential area because the environment is good and the parking area is large, it does not cause traffic jams, parking lot is enough, and at roadside clinics or shop houses, so it is easier to access and easy to see people too. While the result of the mean descriptive analysis in the place variable are the indicator X5.3 (4.588) with the statement "It is important dental clinic in the middle of the city place that is easily accessible by public transportation" the indicator X5.4 (3.663) with the statement "It is important dental clinic that locates in residential" and X5.7 (4.171) with the statement "It is important dental clinic that locates on the side of the road". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the people variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

E. Physical Environment

Based on the results of interviews, the physical evidence variable customer wants a dental clinic that keeps tools and equipment sterile, spacious parking lot, has a playground, good combination building's colors and uniform needed. While the result of the mean descriptive analysis in the physical evidence are the indicator X6.4 (4.892) with the statement "It is an important dental clinic that pays attention to cleanliness and sterility of dental care tools and materials", X6.5 (4.338) with the statement "It is important dental clinic that has a large parking lot", X6.8 (4.025) "It is important dental clinic that facilitate playground for children", X6.9 (3.817) with the statement "It is important dental clinic that has a bright building color", and X6.7 (4.375) with the statement "It is important that a dental clinic service has a dentist and staffs are wearing uniform". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the people variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

F. Process

Based on the results of interviews, the process variable customer wants a dental clinic that are informed the customer about the time for treatment, the queues, what treatment we are going to do and the after effect after doing the treatment, while the result of the mean descriptive analysis in the process variable is the indicator X7.3 (4.783) with the statement "It is important dental clinic that has a well treatment process and appointment system" and X7.6 (4.729) with the statement "It is important dental clinic that explain all treatment processes before taking action during treatment". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the process variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic.

G. Customer Intention

Based on the results of interviews, the customer intention variable customer has the intention to go to a dental clinic that handles patients by an expert, while the result of the mean descriptive analysis in the customer intention is the indicator X8.2 (4.342) with the statement "I will go to a dental clinic that most of the doctors are specialists in dentistry". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the customer intention variable data analysis are included in the factors that make customers have the intention to go to the dental clinic.

H. Customer Decision

Based on the results of interviews, the customer decision

variable customer has the decision to go to a dental clinic that prioritize the service from the doctor that can give satisfactory results, while the result of the mean descriptive analysis in the customer decision is the indicator X9.1 (4.796) with the statement "I decided to choose dental clinic that can solved my complaints about my teeth" and X9.2 (4.737) with statement "I decided to choose dental clinic that can give satisfactory results from the treatment that has been carried out". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the customer decision variable data analysis are included in the factors that make customers have the decision to go to the dental clinic.

The descriptive analysis in Table 4.16 depicts the overall descriptive state based on 250 responses. Based on the five-point Likert scale used in this study, the mean score represents the average value of data. Based on the descriptive analysis results shown in Table 4.16, we can see that the highest mean score is X6.1 (4.908) with the statement "It is an important dental clinic that has a certificate of registration and practice license". This shows that the main reason consumers go to the dental clinic is because of the physical environment from the dental clinic. Meanwhile, the lowest mean score comes from the X2.2 (2.654) with a statement "It is important that dental clinics are cheaper than the other clinic although the service is lacking compared to other clinics." This shows that in terms of price, people will not choose a cheaper dental clinic if the service is worse than other dental clinics, specifically Bandung.

Based on the descriptive analysis above, we can also see that the highest standard deviation score is found in X2.2 (1.191) with a statement "It is important dental clinics are cheaper than the other clinic although the service is lacking compared to other clinics". With a high standard deviation value, the wider the range of data variations in the X2.2 indicator. This shows that on average, people will not choose a cheaper dental clinic if the service is worse than other dental clinics, specifically Bandung. While the results of the descriptive analysis above show that the lowest standard deviation score is found in X6.1 (0.289) with the statement "It is important for a dental clinic that has a certificate of registration and practice license". With a low standard deviation value in the X6.1 indicator. This shows that the answers of each respondent tend to be more varied in the context of the certificate of registration and practice license.

Based on the results of the descriptive analysis that has been carried out by the author by collecting 250 respondents, the mean of 9 variables has a value above 3. This shows that most respondents agree with the results of the interview conducted by the author. So, it can be

concluded that the existing variables can be the customer factors in choosing a dental clinic

IV. DISCUSSION

The paramount objective of the study was to analyze the intention and decision of customers in choosing dental clinic. The results indicate that the seven elements of 7ps marketing mix consist of product (service), place, price, promotion, process, people, and physical evidence are the factors of customer intention and decision in choosing a dental clinic.

A. People

Based on the results of interviews, the people variable customer wants to a dental clinic that are excellent at serve customer excellent, friendly, communicative, not hesitate to answer customer questions, senior doctor, and already known by people. While the result of the highest mean descriptive analysis in the people variable is the indicator X1.4 (4.787) with the statement "It is important that a dental clinic service has a dentist and staffs are reliable". As stated by Al Mugeiren and Al Sanea, 2018 when providing dental care, interactions between staff and clients can create an impression among the client's perceptions of the company. When doctors, nurses and dental staff give a good impression in the eyes of customers, customers will feel comfortable doing treatment at the dental clinic so that it can create a sense of trust between staff and clients. Based on the author's opinion, a dentist must have unique competence in identifying, treating, and preventing dental health disorders or anomalies. Not only that, but dentists and patients must also deal with a variety of gum and oral problems. It would be preferable if the clinic had a dentist who also specialized in resolving dental and oral health problems based on their scientific expertise.

B. Price

Based on the results of interviews, the price variable customer wants a dental clinic that pay the bill depends on the treatment. While the result of the highest mean descriptive analysis in the price variable is the indicator X2.6 (4.654) with the statement "It is important dental clinic that set prices according to the services provided". As stated by Al Mugeiren and Al Sanea, 2018 when providing dental care, the price is the sum of all the amounts paid for dental services by a client. This is the fee for the service. The cost of services is highly variable and is determined by a variety of factors such as the type of client, the time and location of the dental clinic, the level of demand, and available capacity. Service fees and other expenses are important factors that clients consider when looking for services. Therefore it is better if the dental clinic sets the price according to the service provided to customers. Based on the author's opinion, among other health care costs, dentist fees are expensive. Because, to deal

with problems with teeth, dentists do not only examine one part, but examine all parts in the oral cavity. Dental clinics should set the price of treatment according to the service or treatment provided by the dentist. That way, the dentist is able to provide the right diagnosis of what problem you are actually experiencing and can provide the best treatment.

C. Product (Service)

Based on the results of interviews, the product (service) variable customer wants a dental clinic that are maintaining health and beauty aesthetics, able to carry out treatment properly and correctly, service provided excellently, prioritizes cleanliness, and all treatments can be done at the dental clinic (from extraction to surgery) while the result of the highest mean descriptive analysis in the product variable is the indicator X3.2 (4.828) with the statement "It is important dental clinic that cares about hygiene (place, tools, doctor) and aesthetics during and after treatment". It is stated in the journal by Dobros, M. and Katsaliaki, K, 2017, the dentist's services should be comprehensive, covering not only operational issues but also hygiene and aesthetic concerns. Based on the author's opinion, when someone goes to the dentist, he wants better oral and dental health. But if the dentist is dirty, he can actually transmit infections to patients. To prevent the spread of disease through blood, experts recommend that tools should be properly cleaned, i.e. scrubbed in a sink, then rinsed and processed through an autoclave steam cleaner. After that it should be stored in a sterile state and dated. However, some equipment can't be cleaned or reused, so it has to be thrown away every time it's used.

D. Promotion

Based on the results of interviews, the promotion variable customer wants a dental clinic that is get a discount on the next treatment, while the result of one of the mean descriptive analysis in the promotion variable is the indicator X4.2 (4.442) with the statement "It is important dental clinic that offers promos for every treatment". With the results of interviews and quantitative results that are in accordance and have a mean that is above 3, the results of the promotion variable data analysis are included in the factors that make customers have the intention and decision to go to the dental clinic. As stated by Al Mugeiren and Al Sanea, 2018 when providing dental care, dental clinics should use promotional methods to achieve the objective of conveying information about the benefits of certain services. To influence clients about the benefits of special services provided by the clinic; and finally, encouraging clients at certain times to seek treatment at the dental clinic. Based on the author's opinion, all dentists realize the significance of a solid dental clinic advertising plan. This can have a range of good effects,

ranging from more individuals being acquainted with the dental clinic to assisting in strengthening interaction with current patients.

E. Process

Based on the results of interviews, the promotion variable customer wants a dental clinic that are informed the customer about the time for treatment, the queues, what treatment we are going to do and the after effect after doing the treatment, while the result of the mean descriptive analysis in the process variable is the indicator X7.3 (4.783) with the statement "It is important dental clinic that has a well treatment process and appointment system". It is stated in the journal by Dobros, M. and Katsaliaki, K, 2017, marketing success is heavily reliant on patient wait times and proper appointment scheduling for the provision of dental care. Dentists should avoid scheduling appointments more than three weeks in advance because this tactic fills the dentist's schedule for a long time without guaranteeing that patients will stay for the entire treatment. Based on the author's opinion, the treatment process at the dental clinic can usually go through a fairly long process. The system determined by the dental clinic in the treatment process will determine whether the patient will have a sense of comfort and convenience in performing dental care at the dental clinic or not. Therefore, if a dental clinic has a clear treatment process and makes it easier for customers who want to do treatment at the dental clinic.

F. Place

Based on the results of interviews, the place variable customer wants a dental clinic that the area can be reached by public transportation, located in a residential area because the environment is good and the parking area is large, it does not cause traffic jams, parking lot is enough, and at roadside clinics or shop houses, so it is easier to access and easy to see people too. While the result of the mean descriptive analysis in the place variable are the indicator X5.3 (4.588) with the statement "It is important dental clinic in the middle of the city place that is easily accessible by public transportation". As stated by Al Mugeiren and Al Sanea, 2018 when providing dental care, the location for setting up the clinic is important. In general, cost, productivity, and access to labor are important factors. Easy access to transportation to the dental clinic is also very much needed so that patients can easily go to the dental clinic. Based on the author's opinion, the factor that is also important in running a health business is the location factor. The main requirement for a suitable location to set up a health clinic is basically the same as most other businesses, namely that the location is easily accessible to customers, in this case the patient.

G. Physical Evidence

Based on the results of interviews, the physical evidence variable customer wants a dental clinic that keeps tools and equipment sterile, spacious parking lot, has a playground, good combination building's colors and uniform needed. While the result of the mean descriptive analysis in the physical evidence are the indicator X6.4 (4.892) with the statement "It is an important dental clinic that pays attention to cleanliness and sterility of dental care tools and materials". As stated by Al Mugeiren and Al Sanea, 2018 when providing dental care, Clients' first impressions of dental clinics are typically formed by the physical environment, which includes the appearance of buildings, interior furnishings, equipment, staff uniforms, signs, printed material, and other visible signals. Based on the author's opinion, the cleanliness of dental clinic tools is very important in carrying out treatment. In terms of the building, it is also very important in choosing the color of the building, the arrangement of the room, and the physical things that exist in the dental clinic in order to meet the expectations that customers want when visiting the dental clinic.

H. Customer Intention

Based on the results of interviews, the customer intention variable customer has the intention to go to a dental clinic that handles patients by an expert, while the result of the mean descriptive analysis in the customer intention is the indicator X8.2 (4.342) with the statement "I will go to a dental clinic that most of the doctors are specialists in dentistry". As stated by Arslan and Phil 2014, The buying intention of consumers is influenced by quality. If the dental clinic has good quality, for example having a doctor who can be trusted with his flying hours, then the customers will have the intention to come to the dental clinic. Based on the author's opinion, customers have the intention to choose which dental clinic they will go to base on the abilities of the doctors at the dental clinic. By having a doctor who is trusted in handling all patient complaints, among the several existing dental clinics, the dental clinic has a high-quality doctor who will provide high intentions for customers.

I. Customer Decision

Based on the results of interviews, the customer decision variable customer has the decision to go to a dental clinic that prioritize the service from the doctor that can give satisfactory results, while the result of the mean descriptive analysis in the customer decision is the indicator X9.1 (4.796) with the statement "I decided to choose dental clinic that can solved my complaints about my teeth" and X9.2 (4.737) with statement "I decided to choose dental clinic that can give satisfactory results from the treatment that has been carried out". Customers make decisions by combining knowledge to evaluate

more than one alternative behavior and choose one of them. So that patients choose a dental clinic based on a comparison of the quality of dental clinics in the area. They will choose a dental clinic that can solve their dental complaints well. Based on the author's opinion, customers have the intention to choose which dental clinic they will go to base on the abilities of the doctors at the dental clinic. By having a doctor who is trusted in handling all patient complaints, among the several existing dental clinics, the dental clinic has a high-quality doctor who will provide high intentions for customers.

V. CONCLUSION

This research was conducted because Comfort Smile will open a dental clinic branch in Bandung. They want to know what 7Ps are suitable for people who live in Bandung, whether they are the same as the dental clinic branch they have established before or different. This study also wants to know which factors have the most significant influence on consumer intentions and consumer decisions at a dental clinic in Bandung. Furthermore, this research also aims to provide recommendations to increase purchase intention and purchase decision for the dental clinic in Bandung. This study used a mixed method approach by carrying out a survey as the method for the quantitative data collection which is analyzed using descriptive analysis use microsoft excel and interview as the method for the qualitative data collection which is analyzed using coding and use the triangulation approach to authenticate the qualitative data and compare the results to other reputable sources, such as internet articles.

A. Product

A product that allows customers not to have to go to another clinic, such as not having to take X-rays to another lab, everything can be done in one clinic. But what is not only complete, but the dental clinic also maintains cleanliness and sterility during treatment. All treatments can be done at the dental clinic, such as tooth extraction or surgery can be done there and if possible, the pharmacy is also there, so once treatment, you don't have to go anywhere else, just go there.

B. Place

It's better the area can be reached by public transportation if it can be reached by public transportation so access to the dental clinic is not difficult. Roadside clinics or shop houses, so it's easier to access and easy to see people too. The area there is housing and universities. But if you can, it's in a shophouse because the place is better, the location is clear, and the parking lot is also wide.

C. Price

Depends on the treatment. The price depends on the

location too. But the maximum is Rp 500.000. But if come once for Rp 500.000, it's okay, but if you come several times, it's too heavy for Rp 500.000.

D. Promotion

There are people who do treatment for the first time and get an offer for their follow-up product, for example, if the first person scaling gets another promo, he or she can get a discount on the next treatment that is good for the teeth so that they don't get tartar, like getting toothpaste or toothbrush or mouthwash, the main thing is that there's no tartar teeth again in the near future. Promotions for families. For example, filling teeth for children is free of scaling for the father or mother 3 times free scaling, 1 scaling within every 6 months. So, it makes people come back again because it's okay if customers get scaling at this dental clinic, they get free scaling after several treatments

E. Process

The process of treatment more organized, for example, customers have registered, so customers are informed by the clinic what time customers must come, how many queues have customers been in and how many queues customers have. It's the same when customers were asked from the start what our complaint was, so customers were told what action to take with them. Then the after effect after doing the treatment is like how it is. Then the administration is online, so what time do you have to come, how many queues, then you can know like checking at the clinic, how many queues there are, so we can estimate what time we must go, so we don't have to wait so long. The problem is that if you wait like that, for example, it's too long and the system isn't good, it makes us give up and come there too.

F. People

The service is excellent. The staff are friendly, communicative, and do not hesitate to answer customers questions regarding complaints and prior to treatment being informed in advance about the price range of treatment so that patients are not surprised by the cost of treatment which is usually only informed after the treatment is complete. Professional, experienced, already known by people, who are a bit old so the flight hours are already high, so customers trust them more.

G. Physical Evidence

Tools and equipment must be sterile, for example, the mouthwash provided using a disposable mouthwash so that the patient does not use the same glass. Providing doctor's recommendation products according to the dental problems they are facing so that customers have no more trouble finding the products they need to buy. For example, after doing blitching treatment need to use

toothpaste and a toothbrush that is according to the doctor's recommendation and can buy it directly at the dental clinic, so customer don't have to look for it anymore. And also want products such as mouthwash that are not mainstream on the market, there are too strong but there are also products that are not so strong so customers want it to be in the dental clinic. The uniform is needed so we can tell the difference between nurses, doctors, and staff, if possible, there is a name pin so we can call names to say hello when treatment is there. For this pandemic, must wear PPE and you must also have a hand sanitizer ready. Parking is also important, it must be spacious so that access there is so much better for those who bring private vehicles. There should also be a playground, but at least there is a doll or a toy car so it can be used by the children because the wait is long, so the children are not bored because there are toys. For buildings, it's better to be colored but not too eye-catching, so it's humbler, especially for children, so the impression is not too scary, the combination of bright colors makes the children cheerful

From the results of research conducted by the author, the most dominant factor that can influence customers to have the intention and decision to visit a dental clinic is the people factor. Customers have the intention and decision to go to a dental clinic in Bandung, predominantly based on the doctors, nurses, and staff at the dental clinic. The majority people who live in Bandung want a dental clinic that has a senior doctor or a doctor who is already a specialist. For customers, it is very important for doctors, nurses and staff to have a neat and professional appearance so that they have a good impression on the eyes. It is also very important that the dental clinic has communicative doctors, nurses and dental staff so that good relationships can be created with patients. And it is very important that the dental clinic has doctors, nurses and staff who can be trusted to solve their problems during the treatment.

From the results of research conducted by the author, the important factors that consumers consider in the customer's intention and decision in choosing a dental clinic are handled by an expert doctor that most of the doctors are specialists in dentistry, that's what makes us feel safe as patients because the doctor is already an expert in handling dental cases and if the price is competitive, customer must prioritize the service from the doctor, the action that will be taken is also communicated to the patient first so that we as patients are sure and will return to the dental clinic that is right for us in terms of service and price for us. From the quantitative results and interviews, it is proven to be one of the factors in the customer's intention and decision in choosing a dental clinic for treatment.

The application of several marketing principles that are well-known for their benefits in the business world can assist dentists in dealing with the effects of the economic crisis, uncertainty, and competition by recognizing and capitalizing on available opportunities and increasing creativity, thereby retaining their client base. (Dobros and Katsaliaki, 2017)

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Paper 16

Factors Influencing Shopee Indonesia's Consumers
Repurchase Intention on Handphone Accessories

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - In Indonesia, the increasing number of consumers who do online shopping is caused by the rising number of internet users. As a result of government limitations limiting people's mobility and COVID-19's spread, consumers are likely to continue shopping online, especially in e-commerce, for reasons other than health, such as convenience, time savings, and product choices. The primary purpose of this research was to understand factors influencing consumers' repurchase intention on handphone accessories in e-commerce. The questionnaire was distributed through an online survey in Greater Jakarta with 210 respondents who had purchased handphone accessories on e-commerce. This research uses PLS-SEM to analyze the collected data. The results of this research portray that the perceived value and perceived price positively influenced customer satisfaction but negatively influenced consumers' repurchase intention. Customer satisfaction influences both customer trust and consumers' repurchase intention. Furthermore, customer trust positively influenced consumers' repurchase intention. E-commerce practitioners will benefit from the findings of this research when addressing the significance of customer satisfaction and trust in e-commerce' consumers' repurchase intention.

Keywords – E-commerce; Perceived Value; Perceived Price; Customer Satisfaction; Customer Trust; Repurchase Intention

I. INTRODUCTION

Industry 4.0 will be welcomed with open arms by the rise of online shopping and digital marketing. For Internet users, online shopping has become a new way of life [42]. Internet-based buying, sometimes known as "online shopping," refers to the practice of consumers making direct purchases of goods, services, and other items from a vendor using an interactive platform that operates in real-time and does not include any intermediary media [25]. There are many platforms when doing online shopping such as forum buying and selling channels, social networking sites, or e-commerce where firms rely more on achieving their profit goals here [20]. E-commerce or "electronic commerce" refers to a model of doing business that facilitates the purchase and sale of goods and services via the Internet by both private businesses and individuals [6]. E-commerce has various advantages over traditional markets, including lower costs, the ability

to allow comparison shopping, the creation of a market for specialized goods, the ability to circumvent geographical restrictions, and many more [28].

SnapCart has been tracking real-time information on consumer shopping behavior since September 2021, and they found that Shopee is the most popular and well-recognized shopping platform [23]. 75% of those who responded claimed that Shopee was the first online shopping app or website that came to mind when they were asked this question. Shopee is the leading e-commerce platform in Southeast Asia and Taiwan. Consumer electronics, home & living, health & beauty, baby & toys, fashion, and fitness equipment are just a few of the product categories available on Shopee. Not only shopping, consumers can also play games, such as Shopee Tanam, Shopee Tangkap, Goyang Shopee, Shopee Capit, and many more. No wonder all of those User Experiences served by Shopee made Shopee one of Indonesia's most popular e-commerce platforms [5].

The increasing number of consumers who do online shopping is caused by the increasing number of internet users in Indonesia by 32% from 34 million people to 45 million people this year [38]. Along with that, consumers are increasingly doing their shopping online as a result of government restrictions restricting people's ability to move about the country and therefore limiting the spread of COVID-19. Technology improvements and more people working from home (WFH) since the pandemic hit have led to a rise in the number of people in Indonesia who use the internet. This, in turn, has led to a rise in handphone users [12]. It also stimulates the expansion of supporting sectors as the number of handphone users in the community rises. One of them is the industry of handphone accessories, which plays a vital role in supporting daily activities. The effective connectivity of smartphones to the digital world drives the handphone accessories market to continue to grow [10].

The author conducted preliminary research on 40 respondents to find out whether the consumers have the intention to repurchase products they once purchased on Shopee or not. The author divides the daily necessity products into seven categories based on the types of products sold through e-commerce: home utensils and appliances, clothing and accessories, food and drinks, hobbies and sports, health and beauty, electronics and gaming, & entertainment and toys. According to the data

obtained, Shopee is the most often used e-commerce by respondents to purchase daily necessities online. In the 'Electronic & Gaming' category, mainly in handphone accessories, Shopee receives the lowest percentage with only 33% of respondents intending to repeat their purchase on Shopee. However, the results of preliminary research also showed that most of Shopee's e-commerce consumers will have online repurchase intentions at Shopee in the future.

As the data gathered by Asosiasi Digital Marketing Indonesia in 2020 stated, the handphone & accessories products on Shopee rank 5th in the "Shopee's 10 Best Selling Product Categories" with 78.2 million in sales. Nevertheless, based on the preliminary research, the category of handphone accessories products actually got the smallest percentage. Other than that, the author chose handphone accessories because, according to the preliminary research, Shopee was the most chosen e-commerce for people to buy electronic products at first, but Tokopedia was the most popular e-commerce for people to buy electronic products repeatedly. This is contrary to the results obtained by Asosiasi Digital Marketing Indonesia. Therefore, the authors decided to conduct this research, especially in terms of consumers' repurchase intentions for handphone accessories at Shopee based on their past experience of satisfaction and trust. There are many factors and preferences to think about when buying phone accessories on Shopee. Several previous studies found that perceived value, perceived price, customer satisfaction, and customer trust could influence consumers' repurchase intention.

II. METHODOLOGY

A. Measurement Items

A questionnaire was used to get information from the people who took part in the study. The choice of this instrument was good because it made it easier and cheaper to get a lot of data from a respondent at the same time. The questionnaire conducts of respondents' profiles and the research hypotheses used for this study. There is a total of 21 questionnaire indicators given to the respondents. The perceived value consists of three indicators, perceived price consists of five indicators, customer satisfaction consists of six indicators, customer trust consists of four indicators, and last is the repurchase intention consists of three indicators. All of the mentioned measurement items were adapted from previous studies (Ball, Coelho, and Machás, 2004; Fullerton, 2011; Graciola, De Toni, De Lima, and Milan, 2018; Hair, Black, Babin, Anderson, and Tatham, 1998; Hammerschmidt, Falk, and Weijters, 2015; Kim, Galliers, Shin, Ryoo, and Kim, 2012; Srinivisan, Anderson, and Ponnavaolu, 2002; Tsai and Huang, 2007; Zainab, 2018) and were modified so that

they would better fit the purpose of the research. To ensure the validity and reliability of the questionnaire, the pilot study was held.

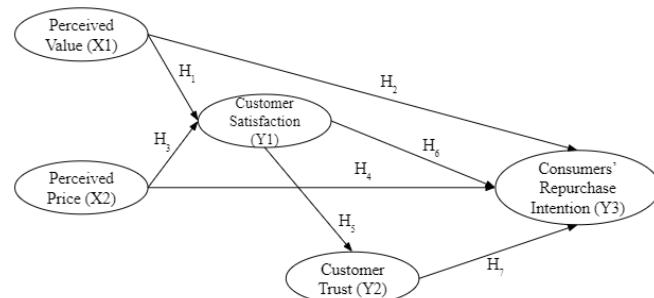


Fig. 1. Conceptual Framework

B. Data Collection

The online questionnaire was distributed to 273 respondents with the use of Google Forms, but only 210 answers will be used for this research. The time range is from June 18, 2022, to June 22, 2022. The author sent the respondents a broadcast message containing the link to access the questionnaire and the purpose for which research was held via Instagram story, Line messenger, and SBM ITB students' personal emails, and distribute it to academic civitas.

III. DATA ANALYSIS AND RESULTS

The respondents' demographic profiles were analyzed using the help of Microsoft Excel and the measurement also structural models were analyzed using SmartPLS version 3.2.9.

A. Respondents' Demographic Profiles

From the collected data, majority of the respondents are female with 119 respondents (56.7%) followed by male with 91 respondents (43.3%). Most of them are the aged between 15-23 years old with 173 respondents (82.4%), followed by the aged 24-39 years old with 31 respondents (14.8%) the aged 40-55 years old with six respondents (2.9%) and none of them are above 55 years old. The respondents who fill in the questionnaire are around Greater Jakarta only. The majority live in DKI Jakarta with 134 respondents (63.8%), followed by the respondents in Tangerang with 51 respondents (24.3%), Bogor with 15 respondents (7.1%), Bekasi with seven respondents (3.3%), and Depok with only three respondents (1.4%).

Among 210 respondents, the majority who filled the questionnaire are 143 college students (68.1%). This is followed by the private sector employees with 46 respondents (21.9%) students with seven respondents (3.3%), entrepreneurs with seven respondents (3.3%),

government employees with three respondents (1.4%) housewives with two respondents (0.9%) alumni (0.5%) and teacher (0.5%) with only one respondent each. The cost of respondents' willingness to spend on handphone accessories are in the range between Rp100.000 – Rp500.000. Most of them are willing to spend in the range between Rp100.000 – Rp300.000, as indicated by 99 respondents (47.1%), followed by 92 respondents (43.8%) willing to spend less than Rp100.000, 13 respondents (6.2%) willing to spend in the range between Rp300.000 – Rp500.000, and only six respondents (2.9%) willing to spend more than Rp500.000.

For the frequency of purchasing handphone accessories, 174 respondents (82.9%) only purchase handphone accessories once a month, 21 respondents (10%) purchase handphone accessories 2 - 5 times a month, and 15 respondents (7.1%) purchase handphone accessories more than five times a month. There are several types of products that the respondents purchased, but the most in-demand and frequently purchased handphone accessory product by respondents is the phone case. Almost all the respondents had purchased cases for their phones at Shopee, which indicates that Shopee excels in offering phone case products and has succeeded in gaining their consumer trust to purchase phone cases on their platform.

B. Measurement Model (Outer Model)

In this part, we will assess the research's validity and reliability. The first step is by assessing the outer loadings numbers, composite reliability, and the Cronbach's alpha (α).

Table 1 - INTERVAL ANALYSIS

Latent Variable	Outer Loadings	Composite Reliability	Cronbach's Alpha	AVE
Perceived Value		0.878	0.792	0.705
PV1	0.853			
PV2	0.866			
PV3	0.799			
Perceived Price		0.875	0.820	0.585
PP1	0.818			
PP2	0.826			
PP3	0.796			
PP4	0.674			
PP5	0.697			
Customer Satisfaction		0.880	0.835	0.552
CS1	0.586			
CS2	0.735			
CS3	0.699			
CS4	0.779			
CS5	0.792			
CS6	0.841			
Customer Trust		0.899	0.851	0.690
CT1	0.807			
CT2	0.807			
CT3	0.839			
CT4	0.867			
Repurchase Intention		0.931	0.889	0.819
RI1	0.886			
RI2	0.930			
RI3	0.898			

As seen in Table 1, the composite reliability and Cronbach's alpha of all variables passed the reliability test since the value are greater than 0.7 [17] and were statistically significant. To be valid, the AVE value must be at least 0.5 or higher [18] indicating that each variable is valid as the AVE values are greater than 0.5. All the outer loadings numbers are greater than 0.4 indicating the outer loadings of all indicators are reliable [43]. Meanwhile in Table 2 below, in terms of discriminant validity, the square roots of the AVEs were placed higher than any other cross-correlations, which indicated that the discriminant validity is accepted [14].

Table 2 - DISCRIMINANT VALIDITY TEST USING FORNELL-LARCKER

Variable	CS	CT	PP	PV	RI
CS	0.743				
CT	0.683	0.830			
PP	0.737	0.544	0.765		
PV	0.601	0.552	0.620	0.840	
RI	0.722	0.640	0.614	0.548	0.905

C. Structural Model (Inner Model)

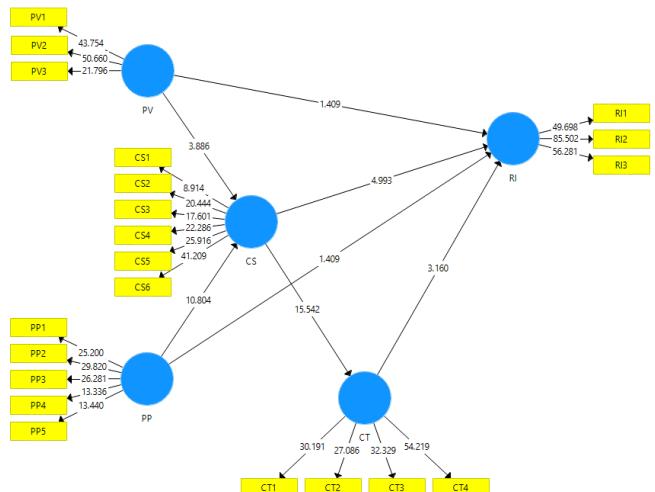


Fig. 2 Structural Model

The structural paths between the constructs are shown in the inner model, which is also called the structural model. Bootstrapping and blindfolding procedures were conducted in SmartPLS to examine the relationship between latent variables by assessing path coefficients and indirect effects. A bootstrapping using 500 subsamples must be used to test for significance. The range of path coefficient values is -1 to +1, with coefficients closer to +1 indicating strong positive relationships and coefficients closer to -1 indicating strong negative or weaker relationships. To be considered significant, the path coefficient must have a T-statistic greater than 1.96 when using a 2-tailed test with a 5% significance level ($P\text{-value} < 0.05$). Meanwhile the purpose of the indirect effect is to figure out how the independent variable affects the dependent variable indirectly by way of the mediating variable. All path coefficients have positive values since

Table 3 - PATH COEFFICIENTS OF CONSTRUCTS

Hypothesis	Structural Path	Path Coefficients	T-value	P-value	Significant ($p < 0.05$)?
H1	PV \rightarrow CS	0.234	3.886	0.000	Yes
H2	PV \rightarrow RI	0.090	1.409	0.159	No
H3	PP \rightarrow CS	0.591	10.804	0.000	Yes
H4	PP \rightarrow RI	0.123	1.409	0.159	No
H5	CS \rightarrow CT	0.683	15.542	0.000	Yes
H6	CS \rightarrow RI	0.413	4.993	0.000	Yes
H7	CT \rightarrow RI	0.241	3.160	0.002	Yes

there are no path coefficients closer to -1. The T-value of perceived value and perceived price to repurchase intention are less than 1.96, and their P-value is more than 0.05, which means that it is not significant. Meanwhile, the structural path of perceived value and perceived price to customer satisfaction, customer satisfaction to customer trust, customer satisfaction, and customer trust to repurchase intention is significant since it has a T-value > 1.96 and P-value < 0.05 . Meanwhile, the result of indirect effects results in Table 4 below show that perceived price has the highest effect on customer trust with 40.4% through customer satisfaction as mediating variable.

Table 4 - INDIRECT EFFECTS RESULT

Variable	Customer Trust	Repurchase Intention
Customer Satisfaction	-	0.164 0.342 0.135
Perceived Price	0.404 0.160	

IV. DISCUSSION

The purpose of this research is to find out the factors that influence Shopee Indonesia's consumers' repurchase intention on handphone accessories. Our research confirms there are several factors that could influence consumers' repurchase intention. The perceived value (PV) had a significant positive influence on customer satisfaction (CS), but not on repurchase intention (RI). One reason could be that the influence of perceived value (PV) on consumers' repurchase intention (RI) needs the mediating effect of customer satisfaction (CS). The perceived price (PP) had a significant positive influence on customer satisfaction (CS), but not on repurchase intention (RI). Therefore, we indicate that both perceived value (PV) and perceived price (PP) variables need the use of mediating variable on repurchase intention (RI) such as customer satisfaction (CS). The findings of this research are in line with the previous study that used customer satisfaction (CS) as a mediating variable [43]. Consumers assume that what has been paid is in accordance with the services and benefits received where the price given is reasonable for the services provided by e-commerce. This can influence consumers to continue the relationship and influence the intention to make a repurchase.

As stated in the previous study, customer satisfaction (CS) had a significant positive influence both on customer trust (CT) and repurchase intention (RI) (Choi and Kim, 2013; Candan and Seda, 2013; Anwar and Gulzar, 2011). Customer trust (CT) is certainly formed by itself based on the satisfying past shopping experience felt

by consumers. Hence, the trust felt by the consumers could influence their next purchase in the future. This is also aligned with this research's finding that confirms customer trust (CT) had a positive significant influence on repurchase intention (RI). This indicates that Shopee Indonesia has succeeded in building their customer trust (CT). The primary consideration is that Shopee Indonesia consumers are extremely likely to make repurchases from the same online retailer if they have already developed a level of trust in the vendor operating within that online retailer.

A. Implications for Research

The purpose of this study was to examine the factors that influence consumers' repurchase intentions (RI) on Shopee Indonesia, specifically perceived value (PV), perceived price (PP), customer satisfaction (CS), and customer trust (CT). By conducting an analysis of consumer behavior within the context of Indonesian consumers, our study makes a substantial contribution to the existing body of academic work on e-commerce. In light of the fact that consumer behavior in developed countries and in emerging economies are not necessarily the same, this study offers some interesting insights from an Indonesian point of view. Due to the fact that either few or no studies have been conducted in this area, this study is considered to be one of the pioneer research projects that employ the specific topic of handphone accessories.

V. CONCLUSION

This research investigates the factors influencing Shopee Indonesia's consumers' repurchase intention on handphone accessories. The results show that there is the influence of customer satisfaction (CS) and customer trust (CT) on consumers' repurchase intention (RI) [2][28]. The customer satisfaction (CS) itself also had a positive significant influence on customer trust (CT) [13][29][41]. On the contrary, perceived value (PV) and perceived price (PP) had no influence on consumers' repurchase intention (RI). Those variables had a positive significant influence only if there was mediating variable, and in this case, customer satisfaction (CS) [27].

This research area is only valid in Indonesia, the findings may not be generalizable to other countries or regions of the world. Additionally, the research investigated exclusively the repurchase intentions of online customers. The repurchase behaviors of actual customers should be measured in further research in order to validate our conceptual model. According to the findings of this research, consumers are more concerned with their level of satisfaction and trust when making a future purchase decision than they are with the perceived value and perceived price. Because of this, online businesses can

focus on their customer service in order to acquire the trust and satisfaction of their consumers.

A. Implications for Practice

The results of our research have implications that can be put into practice by decision-makers, researchers, and marketing managers who are interested in expanding their presence in the Indonesian market. According to the findings, an increase in consumers' repurchase intentions among Indonesian online consumers is likely to occur when the consumers are satisfied and trust the e-commerce. Because there is no real presence, one of the most significant challenges that come with internet shopping is trust. Because of this, decision-makers and those in charge of marketing can direct their efforts to minimize the factors that influence the level of satisfaction and trust that online consumers experience. When consumers trust a specific online store or e-commerce platform, they tend to be loyal and have the intention to make a repurchase with that e-commerce. The best way for an online store or e-commerce platform to keep customers coming back is to answer all their questions and be honest with them. If a customer's previous experiences with an online store or e-commerce platform were pleasant, he or she would be loyal to that e-commerce.

The results also show that consumers are more likely to buy something again if they think it has a higher perceived value. Also, the results show that the relationship between value and the repurchase intention is significantly mediated by satisfaction with online purchases. So, for businesses to succeed in the online environment, they need to give customers a lot of value to make them want to buy again. This is the key to long-term success [29].

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Paper 17

The Influence of Perceived Risk and e-WOM towards Purchase Intention La Paris Products

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Abstract - Even though the Internet has many economic benefits, some customers are still hesitant to buy inspired perfume products online due to perceived risk. The term "Inspired Perfume" is often used in the beauty industry to refer to products that have a similar scent or quality to a certain perfume brand. Buying Inspired perfume online is risky because customers cannot smell the perfume directly. Another point that needs to be investigated is how electronic word of mouth (e-WOM) communication generated by consumer comments on social networking sites can influence customers' purchase intentions in online shopping stores. This research aims to identify the factors that influence consumers' purchase intention of inspired perfume from La Paris and give recommendations that can be implemented by another inspired perfume marketers to create good strategies for online marketing. The data was collected through an online questionnaire and analyzed by PLS-SEM to assess the relationship between the factors. The results show that Perceived Risk does not significantly influence consumers' Purchase Intention, but e-WOM significantly influenced consumers' Purchase Intention. Another highlight is e-WOM variable is significantly influenced consumer's Perceived Risk. Based on this finding, it is suggested that inspired perfume marketers should try and develop online marketing to attract consumers to tell their experience using inspired perfume which may lead to positive purchasing intentions

Keywords - Inspired Perfume, Perceived Risk, e-WOM, and Purchase Intention

I. INTRODUCTION

In today's world, wearing perfume is a pleasant way to display one's individual taste and sense of style. Perfume is now available in a variety of price ranges ranging from quite expensive to relatively inexpensive, and it is also accessible in a variety of intensities. In addition, it is stated that the major market players have concentrated their efforts on generating beautiful, one-of-a-kind, and innovative perfumes that will appeal to a diverse range of consumer groups throughout the world. Asia-Pacific countries such as China, Japan, South Korea, Indonesia, Malaysia, and Singapore are the primary contributors to the region's status as the world's fastest-growing perfume market, surpassing the United States and Europe. During the forecast period, the fragrance and perfume market is expected to grow at a compound annual growth

rate (CAGR) of 5.52 percent (2022-2027). Based on the information provided by [1], Indonesia is a medium-sized market for fragrances and perfumes, as illustrated in the image below derived from the same source.

In the beauty industry, dupes are becoming increasingly popular. The term "Inspired Perfume" is often used in the beauty industry to refer to products that have a similar scent or quality to a certain perfume brand [2]. Inspired perfume, as opposed to fake perfume which claims a product is part of a particular brand that is exactly the same as the original expensive perfume. They always give credit to the original designer's product, but they differentiate themselves by including their own features or characteristics, for example in terms of packaging. In addition, this inspiring presence is not intended to encourage competition or negative connotations between brands, because it appears that each product has a different target market [3].

One of the inspired perfume brands that is now popular among Indonesians is La Paris. The popularity of La Paris has drawn the attention of numerous parties, including customers and other perfume competitors, over the years. Currently, La Paris distributes its products on a variety of channels, including their website, Lazada, JD.ID, Tik Tok Shop (through Tik Tok), Instagram, Facebook, Shopee Mall, Tokopedia, and WhatsApp. The most distinguishing element of a perfume is its scent, which is difficult to demonstrate visually. As a result, the communication effort made by La Paris team to explain the scent of each perfume is to describe the characteristics of each perfume through content on their social media or during live streaming through verbal communication.

There are times when people are hesitant to buy something online because they can't try it first [4]. The Perceived Risk is higher due to a variety of factors, including fear of online purchasing methods and performance of products [5]. Social networks make it easier for businesses to generate and post content for a huge number of potential audiences. In commercial contexts, e-WOM or Electronic Word of Mouth refers to the action of sharing views and ideas about companies, products, or services with others via the internet. Because e-WOM material is frequently viewed as accurate and relevant, e-WOM tends to elicit empathy from customers to buy the products [6].

This study looks at Internet marketing from the

perspective of the consumer. As a result, new and comprehensive research models are required to provide a comprehensive understanding of the mechanism by Perceived Risk and e-WOM influences consumer purchase intention especially for La Paris products. There is also an opportunity in the fact that Inspired Perfume products are still not widely discussed by many researchers. Therefore, a greater understanding of purchase intention is essential for good sales implementation, particularly to grasp the customer's perspective on La Paris and to comprehend consumer behavior in order to enhance the business of the organization.

II. METHODOLOGY

The quantitative methodology utilized in the study to generate objective measurement and the numerical data gathered via the survey method. A quantitative method is used to answer research questions and specific hypotheses [15]. Furthermore, quantitative research is primarily concerned with gathering numerical data and generalizing it across groups of people or explaining a phenomenon [16]. The survey method is defined as a technique for gathering information from respondents by providing lists of relevant questions [15], which is commonly used to address the issues of what, where, who, and how much, which will then be quantitatively analyzed by the researcher to provide feasible justifications among the variables in the research for specified relationship [17]. When using this strategy, a formal set of questionnaires is usually developed. On this occasion the researchers chose to take a sample of 200 respondents and there are several criteria to become respondents in this study: Domiciled in big cities in Indonesia, 17-30 years old, Female, and Familiar with La Paris brand.

All indicators are rated on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). In addition to operational variable questions that will be rated on a 5-point Likert scale 1 to 5, the demographic-behavioral and socio-demographic information was also asked. In this study, the research hypotheses were examined using a Structural Equation Model (SEM) technique based on the Partial Least Squares method (PLS). PLS is capable of understanding the link between variables and of carrying out several analyses in a single test, which is unique. In order to assist researchers in confirming their theories and explaining whether or not there is a relationship between latent variables, PLS is used. A latent variable (one that cannot be directly measured) can be described using the PLS approach, according to [18], and can be quantified by employing indicator variables. Here is the conceptual framework that researcher will analyzed for:

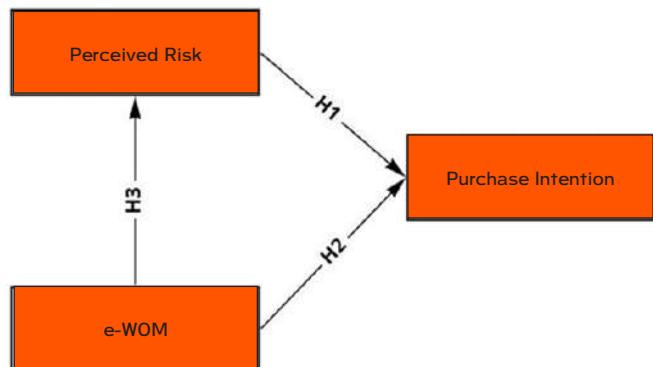


Figure 2. 1 Conceptual Framework

III. RESULTS

A. Respondent Profile

A quantitative approach is conducted through a questionnaire-based survey. From the total of 239 respondents, there are 211 respondents (88.3%) who confirmed that they are familiar with La Paris products. The other 28 respondents (11.7%) who are not familiar with La Paris products are not included in further analysis since they do not meet the criteria of this survey.

Based on the result, from 211 respondents, 52.1% are 16-20 years old, 45% are 21-25 years old, 2.8% are 26-30 years old. The respondents of the questionnaire are spread all over Indonesia, with the most respondents domicile in Bandung (53.1%). In the second position the respondents come from Surabaya (10.9%) and respondents from Jakarta in the third place (10.4%). The respondents also have different jobs and almost all of the respondents are college students (86.3%) with a total amount 182 respondents. In the second place, the respondents are employees (9.5%), students (2.4%), and the others are freelancers, entrepreneur, and doctor.

Based on their income, 78.7% of the respondents (166 respondents) have income in a month in a range Rp0-2,000,000. The following would be 11.4% of the respondents (24 respondents) who have income in a month in a range Rp2,000,000-Rp4,000,000. Next in a range Rp4,000,000-Rp6,000,000 with 15 respondents (7.1%). Last, 2.8% of the respondents (6 respondents) have income more than Rp6,000,000. Next, based on their spending for perfume in a month, 54% of the respondents (114 respondents) spent less than Rp100,000 per month on perfume products, 25.1% of the respondents (53 respondents) who spent between Rp100,000-Rp200,000, 10.4% of the respondents (22 respondents) who spent between Rp200,000-Rp300,000, and 4.7% of the respondents (10 respondents) who spent between Rp300,000-Rp400,000, and the last 5.7% of the respondents (12 respondents) who spent more than

Rp400.000 per month on perfume products.

From 211 respondents, 161 respondents (76.3%) said that they ever had doubts about buying La Paris products and another 50 respondents (23.7%) said that they never had doubts about buying La Paris products. The respondents' answers have different reasons why they had doubts about buying a La Paris product and the biggest percentage of all factors is they are afraid that the scent doesn't match with their expectations (49.8%), they are afraid the product is leaking or damaged (20.7%), and they are afraid the scent won't last long (7.9%).

B. Descriptive Analysis

Descriptive statistics are used to summarize data in an organized manner by describing the relationship between variables in a sample or population [19]. The respondents generally agree that e-WOM in La Paris has good quality in providing them with credible information about La Paris products because on average almost all e-WOM indicators are in the range of 4. Specifically, the E1 indicator "I believe the quality of e-WOM on La Paris social media is helpful enough for my decision-making" has the highest mean score of 4.156. It shows that Quality of e-WOM for customers is helpful enough for their decision-making. This indicator has a minimum score of 1 and a maximum score of 5.

The respondents generally perceive buying La Paris products as not risky because on average all Perceived Risk indicators are in the range of 1-2. The mode seen from each indicator is also worth 2 which means they do not agree that buying La Paris is a risky thing. Last, the respondents generally have medium to high Purchase Intention in La Paris products because on average all Purchase Intention indicators are in the range of 3. The mode seen from each indicator is also worth 4 which means they agree that they are interested in buying La Paris products. Specifically, the PR2 indicator "I think that buying La Paris products is definitely not safe for health" has the lowest mean score of 1.749. However, this statement does not refer to a negative influence, because the statement is also written in a negative sentence. So, it can be concluded that customers agree that buying La Paris products is definitely safe for their health. This indicator has a minimum score of 1 and a maximum score of 5.

According to table 4.8, the R² value of Purchase Intention is 0.506. This suggests that the latent variables used to build Purchase Intention (Perceived Risk and e-WOM) only explain 50.6% of the variance in Purchase Intention and are considered at moderate level. In contrast, the R² value for perceived risk is 0.126, indicating that e-WOM has a low level of accuracy because it can only explain for 12.6%

of the variance in perceived risk. Specifically, PI1 indicator "I'm interested in finding out more Information about La Paris" has the highest mean score of 3.934. It shows that customers are interested in finding out more information about La Paris. This indicator has a minimum score of 1 and a maximum score of 5.

C. Partial Least Square (PLS-SEM) Analysis Result

The construct's predictive importance is proven by the estimated positive Q₂ values. If the value of Q₂ equals one, a model can be said to be perfect (mirror reality). The Q₂ values of Purchase Intention (0.390) and Perceived Risk (0.067) which are positive or verify the predictive significance of the structural model for each construct. The GoF value for this research model is 0.853. This value indicates that the model accurately captures 85.3% of phenomena that occur in the real world. The SRMR (standardized root mean square residual) value of this model is 0.066, which indicates a good fit model because it is less than 0.08.

E. Other Recommendations

As the Inspired Perfume market in Indonesia expands because of increased brand recognition and demand, people are looking for opinions of luxury brand perfumes to learn more before purchasing. Several elements influence consumers' purchasing intentions toward Inspired Perfume, and businesses (particularly La Paris) must pay attention to these factors in order to deliver precise and clear information to viewers and pique their purchasing desire even further.

This study is provided as a reference of improvement for social marketing activities to promote their brand. The result, insights, and recommendations of this study will help marketers, especially in the inspired industry, gain a practical understanding on how a perceived risk and e-WOM could improve customers' purchase intention toward their products directly and through their social media activities. The results will also benefit marketers from the inspired perfume industry by giving them information about their targeted audience characteristics and behaviors.

Based on the results of the quantitative data analysis in the previous chapter, here are some recommendations that can be used by La Paris as follows.

1. It is important to maintain and increase the activity of consumers who have purchased La Paris products so that they can leave comments in the comment section of social media
2. Let consumers keep commenting on their own initiative

because it will look natural or not artificial. Comments that look too overrated can also make comments look fake

3. Invite consumers to provide a clear and detailed review of the fragrance of La Paris products, both in terms of physical, social, financial, and performance. So that consumers can feel more secure and avoid uncertainty.
4. La Paris can continue to post videos or screenshots of comments that consumers provide so that other consumers are also interested in providing their version of the comment because they see that La Paris is a brand that pays attention and responds to every comment from other consumers.
5. Invite consumers to describe what they feel when they smell perfume from La Paris. Is it sweet, fruity, vanilla, warm, etc. Various descriptions from several points of view make consumers more aware of the fragrance.

IV. DISCUSSION

Table 4.1 - Hypothesis Testing Result

Hypothesis	Structural Path	T-Values	P-Values	Result
H1	Perceived Risk → Purchase Intention	1.395	0.164	Rejected
H2	e-WOM → Purchase Intention	13.981	0.000	Accepted
H3	e-WOM → Perceived Risk	6.188	0.000	Accepted

- o There is no significant and negative effect between Perceived Risk and Purchase Intention.

Hypothesis 1 stated that Perceived Risk has no significant and negative influence on consumers' Purchase Intention. However, according to the calculation, the t-value of the hypothesis is below 1,96 (1.395) at a significance point of 0.05 (5%) Due to the result, the hypothesis was rejected. It indicates that Perceived Risk does not have any significant influence on customers' Purchase Intention.

- o There is significant and positive effect between e-WOM and Purchase Intention

Hypothesis 2 stated that e-WOM has a significant and positive influence on consumers' Purchase Intention. However, according to the calculation, the t-value of the hypothesis is above 1,96 (13.981) at a significance point of 0.05 (5%) Due to the result, the hypothesis was accepted. It indicates that e-WOM has any significant influence on customers' Purchase Intention.

- o There is significant and negative effect between e-WOM and Perceived Risk.

Hypothesis 3 stated that e-WOM has a significant and negative influence on consumers' Perceived Risk. However, according to the calculation, the t-value of the hypothesis is above 1,96 (6.188) at a significance point of 0.05 (5%) Due to the result, the hypothesis was accepted. It indicates that e-WOM has any significant influence on customers' Perceived Risk.

The strength of the associations between all the latent variables is evaluated using Cohen's F square (f^2) effect size after the model's path significance and hypothesis have been evaluated [7]. The researcher can use the f^2 effect size calculation to assess the strength or magnitude of the associations between the latent variables and to ascertain the value of each construct for model adjustment [8]. [9] claim that values greater than 0.02, 0.15, and 0.35, depict small, medium, and large f^2 effect sizes respectively.

Table 4.2 f Square Result

Variable	Perceived Risk	e-WOM	Purchase Intention
Perceived Risk			0.011
e-WOM	0.144		0.818
Purchase Intention			

From the f^2 result on the table above, it can be concluded that e-WOM to Perceived Risk has a small effect size. Then, e-WOM to Purchase Intention has a large effect size.

From the research there is no indirect influence on the dependent variable via mediating factors. Also, to search the mediating result, the following conditions must be met in order to achieve the mediating effects [10]:

1. Examine the impact of independent variables on dependent variables; the results of this stage should be significant.
2. Examine the impact of independent variables on the mediation variables; the result should be significant as a result.
3. Examine the impact on dependent variables of independent and mediation variables. In contrast to the expected outcome between independent factors and mediation variables, the expected outcome between mediation variables and dependent variables should be significant.

The purpose of the mediating test is to confirm the mediating effects of the mediating variables. [11] claim that the presence of a third variable that mediates the relationship between the independent and dependent variables is the primary characteristic of the mediating effect. The Perceived Risk variable as mediating variable does not meet the three standards based on the requirements that were previously given. According to

the hypothesis's findings, perceived risk seems to have no significant effect on a consumers' Purchase Intention. Therefore, it is evident that the Perceived Risk variable does not mediate the e-WOM and Purchase Intention variables.

V. CONCLUSION

According to the survey, it has been found that Perceived Risk has a negative and no significant influence on the Purchase Intention of La Paris products. The results of this study are not in line with the findings of [20], who concluded that Perceived Risk had a significant negative influence on Purchase Intention. He said this is important for online businesses because the risk (financial, performance, psychological, social, and quality) is higher than in conventional stores. Consumers must not just provide their credit card and personal information when shopping online; they must also believe the online store to deliver the desired product securely and on time. The development of online commerce and service delivery in recent years has made perceived risk a major issue for online behavior, but did not generate any further action, especially the intention to purchase La Paris products. This might be because La Paris is already making greater attempts to avoid information disarray on their social media platforms [21]. As a result, buyers no longer experience uncertainty when purchasing La Paris products and the Perceived Risk does not significantly influence Purchase Intentions.

According to the survey, it has been found that e-WOM has a positive and significant influence on the Purchase Intention of La Paris products. The results of this study are in line with the findings of According to [13] research, she stated that customers consider the substance of e-WOM information crucial when making a final purchasing decision and have a significant effect on consumer purchasing intention. The quality of e-WOM offered by other consumers who purchased La Paris products first can help other consumers make decisions to purchase La Paris products as well. Research conducted by [12] which indicates that E-WOM makes receivers more receptive or trustworthy, as they represent independent voices without any impediments to being genuine/authentic. That is, potential consumers' La Paris feel that e-WOM could be trusted because it is based on their own ideas rather than pressure or directions from others. Because perceived risk has a big impact, La Paris must pay attention to the e-WOM listed on their social media (for example, in the post comments section), because these comments might influence other potential consumers to make them intent to purchase La Paris products.

Last, e-WOM has a significant and negative effect on consumers' Perceived Risk.

The findings of this study are aligned with [14] research. According to him, consumers can lessen the risk they assume when making purchases online by looking for reliable information about the products they intend to buy. As a result of searching for credible information in the comments column via e-WOM, the uncertainty about the risks discovered is perceived to be lessened because they can first examine the purchasing experiences of other consumers. This explains why there is a negative connection between the two variables. Because when e-WOM increases, the perceived risk decreases. Because perceived risk has a big impact, La Paris must pay attention to the e-WOM listed on their social media (for example, in the post comments section) because these comments might influence other potential consumers to learn about the perceived risks that they will be exposed to.

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Paper 18

Esports' Feasibility as an Entertainment Media: A Study

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Abstract - This research is conducted to find and determine the perks the public can get by engaging in Esports, the adverse effects that can affect Esports and making suggestions on how to improve the Esports scene. This study will be based on interaction in Esports, viewership in Esports, toxicity and aggressive behavior in Esports, as well as in-game purchases in Esports. The results of the data analysis showed that interaction in Esports, viewership in Esports, and in-game purchases in Esports have a positive effect on Esports' feasibility as an entertainment media. On the other hand, no significant effect was found on toxicity and aggressive behavior in Esports to the feasibility of Esports as an entertainment media.

Keywords – Esports; In-game purchases; Media consumption; Online gaming; Toxicity; Video games

I. INTRODUCTION

Video games have been a massive hit among the youth ever since they are found. It's been capturing youngsters' hearts and parenting has never been easier than before thanks to games like Atari's Pong in 1972, the worldwide buzz that is Super Mario in 1985, and games with lifelike graphics and fluid gameplay we've commonly seen these days such as Call of Duty and the annual FIFA games that only gets better in graphics and gameplay as the years go by. To add, playing video games with people (strangers and friends alike) around the world is now a possibility with the invention of the internet, with the internet is a huge part of everyone's lives these days. Video games also promote well-being, especially in youth mental health (Granic, Lobel, and Engels, 2014). As quoted from (Squire, 2011) video games enable the intellectual and social growth of players, as content, overlapping goals, continuous problem solving, social interactions and gaming cultures are critical aspects of learning through games.

Even with limitations like the COVID-19 pandemic, people were still excited to watch Esports games from streaming sites. Spectating Esports games can be seen as the equivalent of spectating any sports, albeit in a different platform (Hamari and Sjöblom, 2016). Though there are already lots of research related to video games, Esports is a relatively new topic. According to (Hamari and Sjöblom, 2016) literature on eSports is still rare and dispersed, and most of this body of literature has focused on the qualitative documentation of visible phenomenon in tournaments.

Video games have been one of humanity's favorite pastimes in the last thirty years or so. What started as another method of having fun become a way to connect with both friends and strangers alike with the help of the internet in a way of online gaming (Jenny, et al. 2018) Just like other sporting activities, those who excel in certain games were starting to look for opportunities. With that, tournaments for talented gamers started to spawn, mainly in Europe and North America. According to (Weiss and Schiele, 2013) as stated by (Hamari and Sjöblom, 2016) competition, challenge and escapism are one of the primary attributes associated with Esports.

Unlike conventional sports such as soccer and cricket, Esports can be considered a nontraditional sport, which uses technology to make participants exempt from direct action (robot fighting, Esports) (Gawrysiak, 2016). Other than viewers coming to the venue to watch Esports games live, viewership in Esports mainly comes from broadcasting channels and online streaming platforms (Grubb, 2015). Watching Esports from live streaming channels also allows viewers to interact with one another through the chat features available (Hamari and Sjöblom, 2016). Based on research conducted by Newzoo in 2017, 42% of Esports viewers do not play the game they watch, similar to baseball fans who watch games on an almost daily basis but do not play the game itself. Despite its potential, many doubt esports' feasibility as entertainment media, especially compared to other sports branches such as soccer (Kane and Spradley, 2017). Gambling in Esports matches can also be considered as one of the ways Esports enthusiasts enjoy Esports. Spectating esports and participation in general forms of gambling are associated with increased esports betting, no direct association was observed between the consumption of video games and esports betting. (Macey, Abarbanel, and Hamari, 2021).

Esports can make brands reach new heights within the industry by striking up partnership deals in the Esports industry (Freitas, et al., 2020). Another industry that has been profiting from Esports is the gambling industry (Macey, Abarbanel, and Hamari, 2020.). For example, Red Bull has been actively involved in Esports since the 2010s, sponsoring teams and tournaments and actively contributing to the Esports community, making the brand associated with extreme activities but also gamers' first choice when it comes to energy drinks. Online betting sites have their dedicated webpage to let their users bet on Esports matches with real money or their in-game

items, converted into real money to gamble with. Some gambling sites are even willing to shell out by sponsoring tournaments and teams instead of just hosting Esports bets. There is no significant relationship between brand image and attention.

Esports has its barriers that prevents it from becoming a mainstream entertainment media. Video games, to some people, is synonymous to violence. According to a study (Barlett et al. 2009) as stated in (Adachi and Willoughby, 2011) have shown, playing a violent video game for 15 min can produce elevated levels of aggressive behavior that lasts between 5 and 10 minutes. Video game players with high aggression are more likely to prefer games with violence in it, although violent contents do not reliably enhance the immersion of players (Przybylski, Ryan, and Rigby, 2009). Even so, the occasional violence in games may make several parents hesitant to expose their children to video games, thus barring them from a chance to fully enjoy Esports contents. To add, Esports players tend to express their satisfaction, especially in the heat of the moment with expletives, hurling verbal abuse towards their opponents.

A. Research Aims

Skepticism around video games and Esports has been around alongside the development of Esports, hindering its growth along the way. Judging from the situation, the researcher wants to discover the feasibility of Esports as an entertainment media. The researcher would like to see whether Esports can become mainstream, or stay as a niche entertainment media. To come to a conclusion, the researcher has come up with research questions for the research:

1. What are the advantages customers find in engaging in Esports?
2. What are the negative impacts that can affect Esports?
3. Making recommendations to improve Esports

Even though there are already lots of research related to video games, Esports is a relatively new topic. Literature on eSports is still rare and dispersed, and most of this body of literature has focused on the qualitative documentation of visible phenomenon in tournaments (Hamari and Sjöblom, 2016). Published quantitative research on the questions of why people watch eSports or why players wish to attend eSports events is, as of yet, non-existent. With this in mind, the researcher hopes to find answers related to customer's perception on Esports, including why people watch Esports games.

II. METHODOLOGY

A. Theory Development Approaches

Judging from the its usage of quantitative method, this research will use deduction approach as this research aims to test verify data and evaluate hypotheses. Deduction approach is used if research starts with theories developed from academic reading, and a research strategy is designed to test the theory. The major characteristics of quantitative research are a focus on deduction, confirmation, theory testing, explanation, standardized data collection, and statistical analysis whereas the major characteristics of qualitative research are induction, discovery, exploration, theory generation, the researcher as the primary instrument of data collection, and qualitative analysis (Johnson and Onwuegbuzie, 2004). Generally, deduction is used to falsify or verify theories created in the early stages of the research. Commonly used in qualitative researches, Induction approach is used to generate untested conclusions. Unlike deduction approach, where the data follows the theory, in induction approach the theory follows the data. Induction approach is used to generate and build theories (Saunders, Lewis, and Thornhill, 2007).

B. Data Collection Method

Due to the quantitative nature of the study, primary data of this research will be collected using survey method with the help of online questionnaire. Online questionnaire in the form of Google Forms is used so it could reach the target respondents easier. The questionnaire will have an opening page to broadly explain the study and a section for every variable looking to be answered. To obtain optimal data and achieve the expected results from the participants, there will be a short explanation in the opening page and in each section of the questionnaire. The questions in the questionnaire will be separated in sections based on the variable, and will come in the form of statements or hypothetical situations for the respondents to answer. The answer will be measured with a Likert scale from one to five. The questionnaire will ask for personal data related to the study (gender, age, and employment status). To avoid biasness, the researcher will only analyze the data given from the participants. The researcher will not take any part in the filling of the questionnaire.

Table 1 - Operational Definition

Variable	Operational Definition	Measurement Indicator	Scale	Esports as an entertainment media (Y)	Esports commonly refer to coordinated, competitive video gaming, where players customarily belong to teams which are sponsored by various business organizations (Hamari and Sjöblom, 2016)	1. Players' expectation towards Esports 2. Attitude towards Esports' future	Likert (1 – 5)
Interaction in Esports (X1)	What started as another method of having fun become a way to connect with both friends and strangers alike with the help of the internet in a way of online gaming (Jenny, et al. 2018)	1. Why people play Esports games 2. Interaction with fellow players in-game	Likert (1 – 5)				
Esports viewership (X2)	Other than viewers coming to the venue to watch Esports games live, viewership in Esports mainly comes from broadcasting channels and online streaming platforms (Grubb, 2015) Based on research conducted by Newzoo (2017) 42% of Esports viewers do not play the game they watch.	1. Why people watch Esports games 2. Attitude towards Esports streams 3. Gambling in Esports matches	Likert (1 – 5)	Esports viewership (X2) Other than viewers coming to the venue to watch Esports games live, viewership in Esports mainly comes from broadcasting channels and online streaming platforms (Grubb, 2015) Based on research conducted by Newzoo (2017) 42% of Esports viewers do not play the game they watch.	Other than viewers coming to the venue to watch Esports games live, viewership in Esports mainly comes from broadcasting channels and online streaming platforms (Grubb, 2015) Based on research conducted by Newzoo (2017) 42% of Esports viewers do not play the game they watch.	1. Why people watch Esports games 2. Attitude towards Esports streams 3. Gambling in Esports matches	Likert (1 – 5)
Toxicity and Aggression in Esports (X3)	As stated by Adachi and Willoughby (2011) playing a violent video game for 15 min can produce elevated levels of aggressive behavior that lasts between 5 and 10 minutes, Barlett et al. (2009)	1. Do players exert toxicity when playing Esports games? 2. What players get from aggressive behavior 3. Attitude towards toxicity in Esports	Likert (1 – 5)	Toxicity and Aggression in Esports (X3) As stated by Adachi and Willoughby (2011) playing a violent video game for 15 min can produce elevated levels of aggressive behavior that lasts between 5 and 10 minutes, Barlett et al. (2009).	As stated by Adachi and Willoughby (2011) playing a violent video game for 15 min can produce elevated levels of aggressive behavior that lasts between 5 and 10 minutes, Barlett et al. (2009).	1. Do players exert toxicity when playing Esports games? 2. What players get from aggressive behavior 3. Attitude towards toxicity in Esports	Likert (1 – 5)
In-game transactions in Esports games (X4)	Zendle, Meyer, and Ballou (2020) stated that the growth of microtransactions has attracted substantial interest from both gamers, academics, and policymakers.	1. Do players spend money in Esports games? 2. Attitude towards transaction system in Esports games?	Likert (1 – 5)	In-game transactions in Esports games (X4) Zendle, Meyer, and Ballou (2020) stated that the growth of microtransactions has attracted substantial interest from both gamers, academics, and policymakers.	Zindle, Meyer, and Ballou (2020) stated that the growth of microtransactions has attracted substantial interest from both gamers, academics, and policymakers.	1. Do players spend money in Esports games? 2. Attitude towards transaction system in Esports games?	Likert (1 – 5)

C. Population and Sample

In this study, the researcher defines the population as video game players who are aware with the existence of Esports worldwide. In determining the sample of this study, the sample are video game players aged 18 years and above. People who might fit the criteria, but belong in at-risk groups such as criminals, or minors below 18 years old are not included in the participation of the study. Participants come from gaming forums, gaming communities, and the researcher personal acquaintances who are familiar with video games and Esports. The researcher was able to collect 135 respondents to conduct the questionnaire.

D. Data Analysis Methods

Several tests were performed to analyze the quantitative data obtained from the questionnaire with the hopes of interpreting the data (Ghozali, 2009) and (Santoso, 2002). Firstly, the data was put through data quality tests (validity and reliability tests) to ensure the data obtained is good enough to be used in the research. After data quality tests have been performed, the data will go through three classic assumption tests (normality, multicollinearity and heteroscedasticity tests) before going through hypothesis testing procedures to figure out whether the hypotheses determined earlier matched with the analysis results or not.

E. Hypothesis Testing

1. Multiple Linear Regression Analysis Test

According to (Sugiyono, 2013), as quoted by (Rosdiana, 2020) Multiple linear regression analysis is used to determine the effect caused by the independent variable indicators of the dependent variable with the following formulation:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4$$

2. Determination Coefficient Test (R²)

Determination coefficient test is used to discover how much the independent variables can do to explain the dependent variable by looking at the magnitude of the coefficient of total determination (R²). A value close to one means that the independent variables provide almost all the information needed to predict the variations in the dependent variable (Ghozali, 2009).

3. Statistical Test t

This test is used to find out how far one individual independent variable can influence in explaining the variation of the dependent variable. The basis for decision making can be done by looking at the probability of its significance (Priyatno, 2014).

- o If the probability of significance is > 0.05, then H₀ is accepted and H_a is rejected.
- o If the probability of significance is < 0.05, then H₀ is rejected and H_a is accepted.

III. RESULTS

A. Data Quality Test Results

Table 2 - Validity Test Results

Variable	Question Item	R count	R table	Information
X1	I regularly play online Esports games.	0.809	0.165	Valid
	I play online Esports games to have fun with my friends.	0.765	0.165	Valid
	I play online Esports games to be better as a player.	0.813	0.165	Valid
	I meet new, interesting people when I play online Esports games.	0.792	0.165	Valid
	I regularly communicate with my fellow players when I play online Esports games.	0.787	0.165	Valid
X2	I regularly watch Esports matches from online streaming platforms.	0.871	0.165	Valid
	I think Esports streams are more accessible compared to other sports.	0.735	0.165	Valid
	I watch Esports matches to support the participating teams.	0.838	0.165	Valid
	I watch Esports matches to learn how to be better at the game.	0.825	0.165	Valid
	I gamble on Esports matches, be it with real money or in-game items.	0.708	0.165	Valid
X3	Insults that I get from other players when playing Esports games motivate me to be better.	0.661	0.165	Valid
	Insults that I get from other players when playing Esports games hurt my feelings.	0.676	0.165	Valid
	I insult my teammates or opponents in Esports games when they play terribly or when I play better than them.	0.827	0.165	Valid
	When I insult my teammates or opponents in Esports games, I feel some sort of satisfaction.	0.844	0.165	Valid
	At this point, I'm already used to toxicity and aggressive behavior in Esports.	0.742	0.165	Valid
X4	I regularly spend real money on in-game items (loot boxes, skins, etc.).	0.930	0.165	Valid
	I feel satisfied every time I buy in-game items.	0.927	0.165	Valid
	I buy in-game items to impress my friends.	0.893	0.165	Valid
Y	I think Esports can become mainstream in the future.	0.907	0.165	Valid
	I am confident in the future of Esports.	0.897	0.165	Valid

Based on the table above, question items that have R count values above 0.165 are considered valid, whereas question items with R count values below 0.165 are considered invalid, and removed from further analysis. From the validity test above, it can be concluded that each and every question items from each variable are valid and can be analyzed further.

Table 3 - Reliability Test Results

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item Total Correlation	Cronbach's Aloha if Item Deleted
X1.1	63.5852	265.409	.666	.926
X1.2	63.0889	272.007	.607	.927
X1.3	63.6222	267.670	.653	.926
X1.4	63.3630	267.114	.708	.925
X1.5	63.5111	270.297	.628	.927
X2.1	63.6519	261.303	.714	.925
X2.2	63.3333	271.567	.614	.927
X2.3	63.6667	265.463	.722	.925
X2.4	63.3704	263.802	.715	.925
X2.5	64.2815	264.875	.568	.928
X3.1	63.7111	277.192	.460	.930
X3.2	63.7778	273.726	.499	.929
X3.3	64.1926	275.515	.444	.930
X3.4	64.3259	275.923	.432	.931
X3.5	63.9926	272.276	.466	.930
X4.1	63.9926	258.022	.756	.924
X4.2	63.8519	260.769	.712	.925
X4.3	64.2815	261.308	.699	.925
Y1.1	62.8667	276.101	.528	.929
Y1.2	62.9556	272.401	.669	.926

Source: SPSS Output Results, 2022

Cronbach's Alpha	N of Items
0.931	20

Based on the calculations above (Table 3), it can be seen that the Cronbach's Alpha value is 0.931. Since the value of the Cronbach's Alpha is above 0.60, it can be concluded that it passed the reliability test.

B. Classic Assumption Test

Table 4 - Normality Test Results

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	0.043	135	.200*	0.989	135	.349

* This is a lower bound of the true significance.

a. Lilliefors Significance Correction

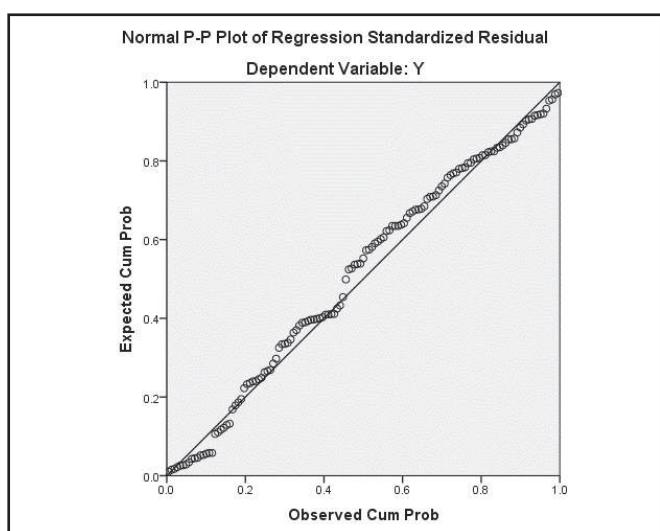


Figure 1 - Normality Test Results

From the table 4 above, it can be seen that the Sig. value for standardized residual is 0.200, meaning that since the Sig. value is over 0.05, it can be concluded that the data of variables come from a normally distributed population.

Table 5 - Multicollinearity Test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.968	.500				.7923	.000
X1	.110	.038	.279	2.911	.004	.420	2.379
X2	.127	.037	.354	3.456	.001	.369	2.711
1 X3	-.050	.029	-.128	-1.765	.080	.736	1.359
X4	.101	.045	.213	2.249	.026	.433	2.312

a. Dependent Variable: Y

From table 5 shown above, it can be seen that there is no multicollinearity between the independent variables since there is no independent variable with Variance Inflation Factor (VIF) values above 10.

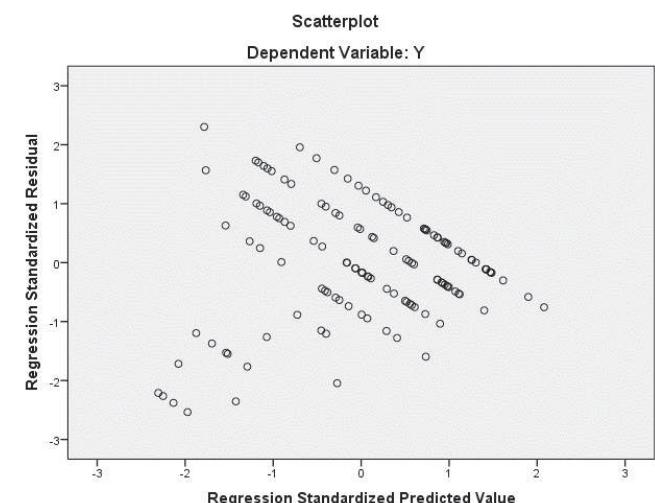


Figure 1 - Normality Test Results

Based on the figure above, it can be seen that the scatterplot test result has a random spread without any discernible pattern. From this, it can be concluded that there is no heteroscedasticity in the data analyzed.

C. Hypothesis Test Results

Table 6 - Multiple Linear Regression Test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.968	.500				.7923	.000
X1	.110	.038	.279	2.911	.004	.420	2.379
X2	.127	.037	.354	3.456	.001	.369	2.711
1 X3	-.050	.029	-.128	-1.765	.080	.736	1.359
X4	.101	.045	.213	2.249	.026	.433	2.312

a. Dependent Variable: Y

Table 6 - Results of Coefficient Determination (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	.705 ^a	.496	.481	1.393.66	.742

a. Predictors: (Constant) X4, X3, X1, X2

b. Dependent Variable: Y

From table 7, it can be seen that the value of R-Square is 0.496. This states that 49% of the variable Y is influenced by X1, X2, X3, and X4, while the other 51% is influenced by other variables unexplained in this study.

Table 7 - Results of F-Test

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression Residual Total	105.938 199.795 305.733	4 130 134	26.485 15.37	17.233	.000 ^b

a. Dependent Variable: Y

b. Predictors: (Constant), X4, X3, X1, X2

Based on the F-test results seen on table 8, it can be seen that the Sig. value is 0.000 < 0.05. With that in mind, H0 is rejected and H1 is accepted since there are significant influences in Y from X1, X2, X3, and X4.

Table 9 - Results of T-Test

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	3.968	.500		7.923	.000		
X1	.110	.038	.279	2.911	.004	.420	2.379
X2	.127	.037	.354	3.456	.001	.369	2.711
1 X3	-.050	.029	-.128	-1.765	.080	.736	1.359
X4	.101	.045	.213	2.249	.026	.433	2.312

a. Dependent Variable: Y

H0: There is no significant influence from X to Y

Ha: There is a significant influence from X to Y

From table 6, we can see by comparing Sig. value to $\alpha=0.05$, it can be concluded that:

X1: Sig. Value 0.004 < 0.05. Reject H0, accept H1.

X2: Sig. Value 0.001 < 0.05. Reject H0, accept H1.

X3: Sig. Value 0.080 > 0.05, Accept H0, reject H1.

X4: Sig. Value 0.026 < 0.05, Reject H0, accept H1.

IV. DISCUSSION

The results of regression calculations performed from the questionnaire in this study show that the interaction in Esports variable (X1) has a significance value of 0.004, where this value is smaller than the error tolerance limit of 0.05. From this statement, it can be concluded that H1 is accepted, which means that interaction in Esports has a significant positive effect on Esports' feasibility as an entertainment media. Gamers can find challenge and escapism from their respective daily lives in Esports games (Hamari and Sjöblom, 2016). Other than escapism and challenge, gamers can also find new acquaintances by playing Esports games.

From this study, it can be concluded that the respondents' view on Esports were affected by the viewership in Esports. This can be seen in the calculation results shown by the t-test that is used to measure that the viewership in Esports variable (X2) has an effect on the feasibility of Esports as an entertainment media. The result from the t-test for X2 is a significance value of 0.001, which is smaller than the error tolerance limit of 0.05. From this data, it can be concluded that viewership in Esports has a significant positive effect on investment decisions.

The results of the calculation of this study show that the variable toxicity and aggressive behavior in Esports variable (X3) has a significance value of 0.080, which is larger than the error tolerance limit of 0.05. This means that H3 is rejected, which can be concluded that there is no concrete link between toxicity and aggressive behavior in Esports and Esports' feasibility as an entertainment media. According to a study, it can be concluded that violent content in video games do not reliably enhance the immersion of players (Przybylski, Ryan, and Rigby, 2009).

The results of the calculation of this study indicate that the in-game transaction in Esports variable (X4) has a significance value of 0.026, which is smaller than the error tolerance limit of 0.05. From this fact, it can be concluded that H4 is accepted. Therefore, in-game transactions in Esports have a significant effect on Esports' feasibility as an entertainment media. Respondents tend to purchase in-game items in the games they play to increase their immersion and gaming experience. On the game developers' side, in-game transactions can boost their games' profitability and the extra capital can be used for the betterment of the games, or competitions for the games themselves.

V. CONCLUSION

From the questionnaire and the research questions presented prior, it can be stated that Esports enthusiasts find several benefits from getting involved in Esports. Those benefits are namely having fun with peers; meeting new people; watch professional Esports matches; and gratification from playing video games and being good at it. It can be noted that a small portion of respondents also gamble in professional Esports matches. However, adverse impacts can also be found in Esports, such as exposure to aggressive behavior from fellow players.

Based on the results of data analysis performed from the obtained data through the questionnaires distributed to respondents, several conclusions can be obtained: (1) Interaction in Esports has a positive effect on Esports' feasibility as an entertainment media, the better interaction an Esports game gives to its players, the more the game can give growth to the Esports industry. (2)

Viewership on Esports has a positive effect on Esports' feasibility as entertainment media. It can be concluded that the significance value of the viewership of Esports variable has a significant positive effect on the feasibility of Esports itself. The higher the number of viewers of Esports, the higher it can reach its status as a mainstream entertainment media. (3) Toxicity and aggressive behavior in Esports variable have a negative effect on Esports' feasibility as an entertainment media. There is no significant link that could connect toxicity in Esports to Esports' feasibility as an entertainment media. If anything, results from the questionnaire shows that toxicity in Esports ruins the fun of some respondents when playing Esports games. (4) In-game transactions in Esports games has a positive effect on Esports' feasibility as an entertainment media. In-game purchases may increase the fun players can have with Esports games, and purchases made by players increase the games' profitability, thus making the games and Esports industry an interesting business prospect for potential investors.

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Paper 19

Proposed Business Strategy And Sales Process Modelling
For Pt XYZ Indonesia As Factory Automation Solution
Provider For Manufacturing Industries

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - PT XYZ Indonesia is factory automation solution provider to manufacturing plants in Indonesia. There are several business issues in this company which related with business strategy, sales process model, and high pricing condition. Internal and external analysis of this company are conducted by using VRIO, PESTEL, and Porter's 5 forces framework to solve the issue. The result of these analysis is summarized by SWOT framework to know about current company situation. After that, TOWS matrix is conducted to develop business strategy considering the strength, weakness, opportunity, and threat. Sales process modelling also established after getting the suitable business strategy. This sales process modelling came from sales funnel B2B framework which classify customer journey from beginning to end. Lastly about product price, the financial investment analysis is conducted for upcoming project about camera inspection system to replace human power. From seller's perspective, the financial analysis will be done by capital budgeting technique considering customer's evaluation factors such as NPV, IRR, and Payback Period calculation. Sensitivity analysis is also conducted to see which variables are the most significant to change the NPV value.

Keywords - camera inspection, factory automation, investment analysis, sales process model, sensitivity analysis, SWOT analysis, TOWS matrix

I. INTRODUCTION

Manufacturing sector in Indonesia accounts for about 19.7% of Indonesia's GDP. Currently, Indonesian government and many business players want to increase the productivity in this manufacturing sector. One of the ways to increase the productivity in manufacturing segment is by implementing factory automation systems. In this case, PT XYZ Indonesia is factory automation solution provider to manufacturing plants in Indonesia. Factory automation is the implementation of technology and systems to automate a manufacturing process with the goal of increasing productivity and reducing costs.

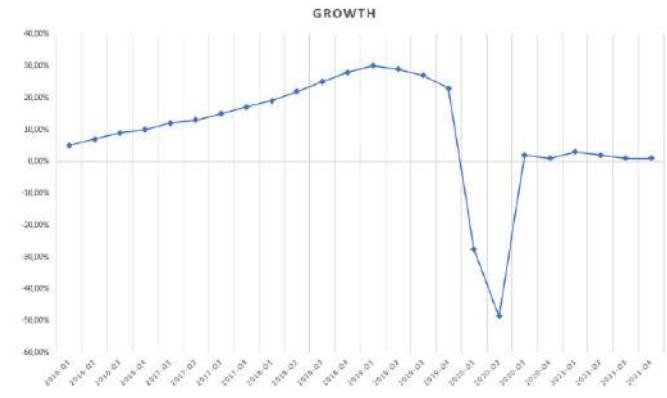


Fig. 1. Stagnant growth and decreasing sales result of PT XYZ Indonesia

The outbreak of coronavirus 2019 (COVID-19) has given huge impact to our lives. This virus infected so many people and bring disaster to everyone health. COVID-19 also give big chaos on global economy. This outbreak is also affecting the business of PT XYZ Indonesia, especially in terms of declining sales amount as shown in Figure 1.

Currently, there are 3 main problems that this company face sales result, business growth, and number of lost projects. Firstly, the sales result has decreasing trend from 2020. This condition even has worse condition until now. Secondly, the business growth is quite stagnant as shown in Figure 2. Stagnant growth means that the company does not expand its market. Thirdly, there are many projects are lost because many customers reject the proposal for factory automation implementation for their production lines.



Fig. 2. Stagnant growth and decreasing sales result of PT XYZ Indonesia

From these problems, the analysis is being conducted to see the main issues and the solution to overcome this condition. Thus, the highlighted part that need to be identify is as follows:

1. Business strategy of PT XYZ Indonesia
2. Sales process model in B2B factory automation segment industries
3. Pricing strategy for customers to solve overprice products problem

II. METHODOLOGY

The business solution that will be brought-up shall be based on the problem occurred in the organization. To know this, the root cause analysis must be identified. Root cause analysis (RCA) is the systematic method of discovering the root causes of problems to identify appropriate solutions. In this case, the root-cause analysis will be conducted by using the 5 Whys framework for each problem that happened to PT XYZ Indonesia in recent years as shown in Figure 3.



Fig. 3. Root cause analysis by five whys frameworks

By implementing the five whys technique for all three problems that stated above, then the solution that must be done is as follows:

1. Develop clear business strategy to overcome stagnant growth conditions
2. Establish sales process model to understand about bottleneck phases
3. Conduct investment analysis about automation product considering customer's evaluation point such as NPV, IRR, and Payback Period

Business strategy development is conducted by implementing SWOT analysis and TOWS matrix. From the TOWS matrix as shown in Table 1, the clear detail action points for PT XYZ Indonesia can be formulated.

Table 1. TOWS matrix framework

Internal Factors External Factors	Strengths:	Weaknesses:
Opportunities	SO Strategies: Generate strategies that use strength to take advantage of opportunities	WO Strategies: Generate strategies that take advantage of opportunities by overcoming weaknesses
Threats	ST Strategies: Generate strategies that use strength to avoid threats	WT Strategies: Generate strategies that minimize weaknesses and avoid threats

Sales process model formulation is based on B2B sales funnel as shown in Figure 4. Based on this sales funnel which staging the customer's journey from beginning to end process of the sales, the pain point can be analyzed more deeply.



Fig. 4. B2B sales funnel

Investment calculation for upcoming camera inspection system project by capital budgeting technique is the main tool for PT XYZ Indonesia to understand about their product's price condition. This technique will be done from seller's perspective, but also considering customer's focus point for automation investment such as NPV, IRR, and Payback Period as shown in Figure 5.

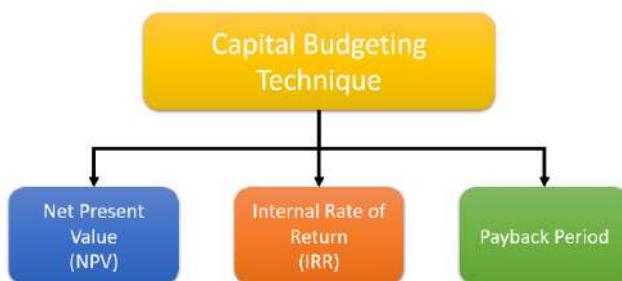


Fig. 5. Capital budgeting technique

A. Business Strategy

Firstly, for formulate business strategy, PT XYZ Indonesia must understand fully about their business situation. In this case, internal and external environment analysis are conducted. External analysis is conducted using PESTEL and Porter's five forces. Internal analysis is conducted by VRIO framework.

Based on PESTEL analysis as shown in Table 2, mostly all the elements are supporting PT XYZ Indonesia because currently many manufacturing plants want to implement factory automation in their production process to be more effective and efficient to generate more profit for their business. Besides that, government also support for factory automation implementation because it could generate more productivity to improve economic situation in Indonesia. The negative impact comes from social aspect where it has a big potential which relates about protest from labor because their jobs are replaced by machine systems.

Table 2. PESTEL analysis

Element	Factor	Business Impact
Political	<ul style="list-style-type: none"> Indonesia government promote development of innovative technologies, especially technology to improve productivity Indonesia government support manufacturing industry with certain policy to get higher profit 	Positive Impact
Economic	<ul style="list-style-type: none"> Faster economic growth in the long run due to automation Increasing labour wage in Indonesia War Trade which affects commodities price 	Positive Impact
Social	<ul style="list-style-type: none"> Public sentiment towards restricting automation to jobs that are dangerous to human Low trust of human manual inspection since many reject products are passed to customers Digital lifestyle in our daily lives 	Negative Impact
Technological	<ul style="list-style-type: none"> Importance of automation in products inspection Business embracing automation to mitigate risks Global sensor market to see growth in the future 	Positive Impact
Environmental	<ul style="list-style-type: none"> Go green via automation Reduce scrap from manufacturing process Reduce emission from manufacturing plant 	Positive Impact
Legal	<ul style="list-style-type: none"> UU Cipta Kerja / Omnibus Law Health and Safety Laws Consumer Protection Laws 	Positive Impact

Porter's five forces analysis is a framework that attempts to analyze the level of competition within an industry and business strategy development. There are five forces that need to be analyzed to evaluate the condition in automation industry in Indonesia: degree of rivalry, threat of new entrants, substitute products or service, bargaining power of buyers, and bargaining power of suppliers. Below is explanation of Porter's five forces analysis:

Table 3. Porter's five forces analysis

No	Porter's Five Forces	Consideration Factors	Analysis
1	Degree of Rivalry	<ul style="list-style-type: none"> Number of competitors Quality differences Switching costs Customer loyalty Industry growth 	<p>A. Switching cost to other brands is very easy. In automation industry, most of parts are consumable parts and all competitors already have head-to-head technical data amongst them.</p> <p>B. There are so many existing competitors name which already well established. There are many competitors from Japanese brand and European brand which have similar qualities. The problems are customer preferences when they are using sensor products.</p> <p>C. Difficult to differentiate for some specific products. In this automation industry, the differentiation between each product is quite small. All the players already have the similar products which similar price amongst them.</p>
2	Threat of New Entrants	<ul style="list-style-type: none"> Cost advantages Barriers to entry Technology Economies of scale Specialist knowledge 	<p>A. New brand from China with cheaper price. Manufacturing industry in Indonesia is quite promising. All the production lines must need the sensor to make sure the production is running. In this digitalization era, many new brands are more easily to be recognized.</p> <p>B. Many distributors have import-export permit. This reason will make them easier to import unknown brand with low-cost shipping. They have good resources to make sure the items are ready and easily to deliver it to customer's place.</p>
3	Threat of Substitute Products or Service	<ul style="list-style-type: none"> Switching cost Number of substitute products Price of substitute products Customer preference Substitute performance 	<p>C. Indonesia already has the laws which implemented by UU No. 40 Tahun 2007 about Limited Liability Companies and UU No. 25 Tahun 2007 about Capital Investment.</p> <p>A. For new projects, engineering or production division will list all the electrical equipment such as sensors and machines. In this case, automation sensor is a must and primary needs for new project without any substitute products.</p> <p>B. All the production lines must be using sensors as consumables. In most cases, there is no substitute product to replace sensors.</p> <p>C. On some occasion, they can replace sensor by human, but cannot guarantee the process of the production since human capability in this case is very limited.</p>
4	Bargaining Power of Suppliers	<ul style="list-style-type: none"> Number of suppliers Size of suppliers Price offering Service uniqueness Cost of changing 	<p>A. Many suppliers inside and outside Indonesia can supply to PT XYZ. As electronic parts assembler, PT XYZ has many choices of suppliers, and they can provide their products which have similar price with similar delivery time.</p> <p>B. Written contract agreement based for assembly our products to our suppliers. As long-term agreement, PT XYZ always do the written contract with our suppliers to keep minimize our cost and delivery time.</p> <p>C. Digitalization eras reduce supplier power. PT XYZ is easily to change the suppliers since we are now in digitalization era where we can find the substitutes in single click.</p>
5	Bargaining Power of Buyers	<ul style="list-style-type: none"> Number of customers Size of each order Information access Price sensitivity Cost of changing 	<p>A. Low switching cost for buyers. Buyer can change the seller as easy as they want since there are many brands on the market.</p> <p>B. Price sensitivity for big order base. Since sensors are always used in the production process, many buyers will buy it periodically. Slightly cheaper price for one item will affect total cost since they buy it in big quantity.</p> <p>C. Buyers have many available information about our products. They have many data about out stock and delivery time of some similar equipment.</p>

From Porter's five forces framework as shown in Table 3, there are several aspects that PT XYZ Indonesia must focussed on. Rivalry level, new competitors, and buyers powers are the important points because they have big impact to business condition of PT XYZ Indonesia. In this case, the summary illustration of each force can be seen in Figure 6. In Figure 6 also, there are written the points how to handle each forces to strengthen PT XYZ brand in Indonesia:

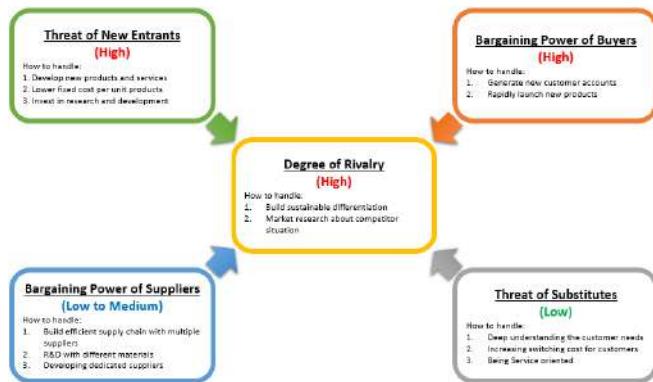


Fig. 6. Porter's five forces analysis

VRIO analysis is conducted to help organizations uncover and protect the resources and capabilities that give them a long-term competitive advantage. VRIO is an acronym for a four-question framework focusing on Value, Rarity, Imitability, and Organization, the criteria used to evaluate an organization's resources and capabilities. The VRIO framework is an internal analysis tool, used by organizations to categorize their resources based on whether they hold certain traits outlined in the framework. Below is the VRIO analysis of PT XYZ Indonesia from several resources and capabilities:

Table 4. VRIO analysis

No	Resources and Capabilities	V	R	I	O	Conclusion
1	Product quality and feature	✓	✓	✓	✓	SCA
2	Direct sales method	✓	✓	✓	✓	SCA
3	Brand Awareness	✓	✓	✓	✗	UCA
4	Delivery time	✓	✓	✗	✗	TCA
5	After sales support	✓	✓	✓	✓	SCA
6	Strong financial performances	✓	✓	✗	✗	TCA
7	Access to technology providers, platforms, and vendors	✓	✓	✗	✗	TCA
8	High quality human resources	✓	✓	✗	✗	TCA
9	Marketing capabilities and planning	✓	✗	✗	✗	CP
10	Proven customer database	✓	✓	✓	✓	SCA
11	Internal approval process	✓	✗	✗	✗	CP
12	One solution system provider	✗	✗	✗	✗	CD
13	Employee internal career path	✓	✗	✗	✗	CP
14	Product price	✓	✗	✗	✗	CP

After internal and external environment analysis, SWOT analysis also is conducted to mapping current situation of PT XYZ Indonesia. SWOT analysis is a strategic planning and strategic management technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning. Strength and Weakness come from internal environment analysis, and Opportunities and Threats come from external environment analysis.

Table 5. SWOT analysis

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> Leading player in factory automation with a global network all around the world Forbes Top 100 most innovative companies in the world Direct sales approach to customers 70% products featuring in world's first technology Fast delivery, 1 day shipping Free of charge for after sales service Proven customer database Strong financial support 	<ul style="list-style-type: none"> Cannot sell solution as a system, need other parties as integrator High price compares to benefit for customers High Turnover for employee Low marketing capabilities Complicated approval system internally Door-to-door sales without proper planning
OPPORTUNITY	THREATS
<ul style="list-style-type: none"> Big potential issue for human error in production process IoT trends is increasing nowadays Increasing labour cost yearly Food beverages and pharmacy industry segment which still not yet touched Increasing SME segment which produced final goods Booming of Electric Vehicle (EV) Reduce cost and Kaizen project for every manufacturing plant 	<ul style="list-style-type: none"> Cyber security threats in manufacturing New competitor from China with lower price Natural disaster will affect the supply chain Protest from Labour Union US-China trade war that may increase commodity price Negative economic growth which decreases demands for automotive segments

TOWS Matrix is a strategic tool which is used to develop business strategy by analyzing more deeply about factors which already stated in SWOT analysis. This framework combines all the elements that are identified in previous section to generate multiple strategies as shown in Figure 7. The matrix is shown by anayzing the external opportunities and threats in comparison to the internal strength and weakness.

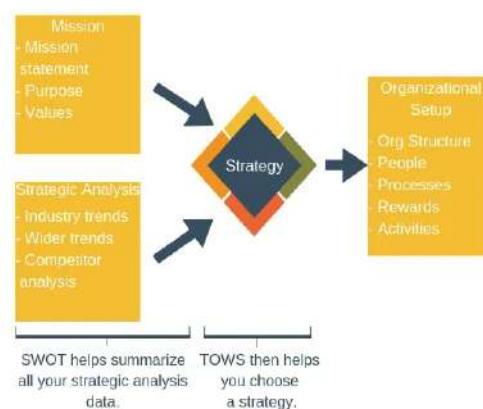


Fig. 7. TOWS matrix strategy generation

Based on previous analysis, the business strategy for PT XYZ Indonesia can be formulated. This business strategy is to scale up the business and capture the business opportunities for PT XYZ Indonesia. Some of important focus strategy that PT XYZ Indonesia must do for their business are:

- o Implement direct sales strategy to stay ahead of the competitor with three approaches: direct approach, comprehensive support, and fast delivery
- o Establish simple internal approval system for special price and CRM to reduce loss time and increase efficiency
- o Develop and establish specific sales model system which suit our business process especially in B2B segment for factory automation products
- o Hire expertise in marketing area to be the market intelligence to get correct strategy to penetrate Indonesian market
- o Focus to specific sensor items which give high benefit to customers such as camera vision, laser sensor, and safety sensor
- o Choose official partners as main integrator to promote single solution system
- o Expand to automotive Electric Vehicle manufacturer since this segment is quite trending in recent years.
- o Expand the customers on food beverage, and pharmacy. F&B and pharmacy sectors quite increasing after COVID-19 situation and have big potential for sales amount
- o Penetrate to SME and home industry segment as new target market. SMEs, which account for 60 percent of Indonesia's gross domestic product (GDP) and 97 percent of domestic workforce, are after all the backbone of the domestic economy.
- o Focus to develop IoT, Industry 4.0, and OEE. These three points are quite trend right now in manufacturing industries. Many manufacturing plants want to implement IoT, Industry 4.0, and OEE as their main standard for digitalization in factory and production processes.

B. Sales Approach

As already stated above in business strategy section, PT XYZ Indonesia must utilize their strength as "direct sales" supplier to their customers. This "direct sales" is one of the main strengths of PT XYZ Indonesia compared to

their competitors. This strength comes with three sales approach as shown in Figure 8.



Fig. 8. Sales approach

Direct approach means that their technically trained sales engineers have extensive product knowledge along with application and industry experience. This experience and specialization allow the most efficient solution to be quickly recommended to customers, saving invaluable time.

Comprehensive support means PT XYZ Indonesia supports customers with extensive on-site manufacturing and automation knowledge. Their sales engineers are ready to provide comprehensive support at every level of business, from the design and research stage to model selection, line operation with on-site instructions, and after product adoption.

Fast delivery means PT XYZ Indonesia ensures that customers get their required products whenever they need them. Products are shipped from warehouse centers in Japan, Singapore, Malaysia, India, Thailand, China, Taiwan, South Korea, U.S. (Chicago), Canada, Mexico, Brazil, the U.K., Germany, France, Belgium, and Italy as well as many other locations worldwide.

C. Sales Process Modelling

Sales models outline how to make a sales process work. Sales process is a set of repeatable steps that a salesperson takes to take a prospective buyer from the early stage of awareness to a closed sale. In this case, PT XYZ Indonesia proposed their own sales process model as shown in Figure 9.

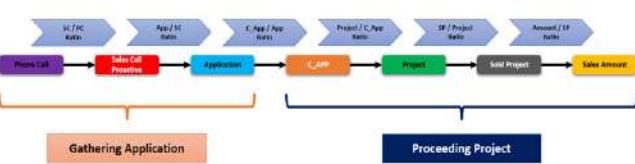


Fig. 9. Sales process model

Basically, there are two main stages in this sales process model which are "Gathering Application" and "Proceeding Project" phases. The first phase is "Gathering Application" where this stage is the process when our sales engineers accumulate the application from their proactive action

such as visiting customers or phone call to correct person to collect meaningful information. The second phase is "Proceeding Project" where this stage is the process where we proceed the application to generate sales amount as our achievements.

In detail of this sales process model, there are 7 detailed stages which show the journey of customers from the beginning they aware of PT XYZ Indonesia until they purchase the factory automation products. Below is detailed explanation of each phase in this proposed sales process model:

- o Phone Call :the first stage where the salesperson call via phone to our prospected customers to arrange meeting together
- o Sales Call :arranged face-to-face meetings between a salesperson and prospect with the goal of making a sale
- o Application :the stage after the sales call where customers have interest about automation products
- o C_App :the stage where salesperson already finished the test report/ proposals, already sent the quotation, and get approval from decision makers.
- o Project :the stage where the applications already have the timeline or schedule, but not yet get the purchase order (PO)
- o Sold Project :the stage where the company got the Purchase Order (PO) from customers.
- o Sales Amount :the amount that PT XYZ Indonesia will get after customer's PO based on invoice sent to customers.

D. Investment Analysis

As already stated in previous chapter, where this investment calculation will be one of the tools for PT XYZ Indonesia to consider about their products price. By using capital budgeting process, PT XYZ Indonesia will calculate the financial aspect from customer's side when they want to buy automation products. Basically, the calculation will be done from seller's perspective, but in this case, the calculation also considers the evaluation focus point from customer's perspective.

Firstly, the cost of equity must be calculated. This cost of equity will be the discount rate for this case analysis. Below is the table for cost of equity calculation:

Table 6. Cost of equity

Variables	Value	Reference
Risk-free rate	7%	Government bond (Bank Indonesia, 2022)
Beta	0,84	Beta of PT ABC Indonesia (Yahoo Finance)
Market risk premium	6,12%	Damodaran country default spreads and risk premiums (Damodaran, 2022)
Cost of equity	12,14%	-

For capital budgeting calculation, there are some general assumptions. These general assumptions are shown in Table 7

Table 7. Calculation general assumptions

No	General Assumptions
1	Working days/month : 20 days
2	Working hour/day : 8 hours
3	Production/minute : 20 products
4	Production/day : 9.600 products
5	Production/month : 192.000 products
6	Product price : IDR 750
7	Inspection operator : 1 person
8	Tax rate : 22%
9	Timeframe analysis : 2 years (24 months)
10	Depreciation method : Sum-of-the-Years Digits
11	After 2 years, the machine will be scrapped without any value

After that, initial capital investment also must be calculated. Initial capital investment is the amount required to start a business or a project. Capital investment is the expenditure of money to fund a company's long-term growth. In this case, the focus will be on camera price, where bracket, service, and other cost are assumed same in all condition.

Table 8. Initial capital investment

Initial Capital Investment (IDR)		
1	Camera (Main Products)	230.000.000
2	Bracket	40.000.000
3	Service	60.000.000
4	Other cost	50.000.000
Total Initial Capital Investment		380.000.000

Based on this capital budgeting calculation, there will be three different scenarios. Scenario #1 will use normal price camera without any discount. It can be concluded that current camera price with IDR 230 Mill will not give any benefit to customer in 2 years timeframe. The NPV and IRR values are negative, and the payback period is more than 2 years as shown in Table 9. This is the main reason why many customers reject the automation project implementation in their production line.

Table 9. Scenario#1 capital budgeting calculation

Mous	0	1	2	3	4	5	6	7	8	9	10	11	12
Operating Cost	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Discount Rate	0	0	0	0	0	0	0	0	0	0	0	0	0
NPV	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
IRR	0	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Payback Period	0	2 years											

Mous	0	1	2	3	4	5	6	7	8	9	10	11	12
Operating Cost	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Discount Rate	0	0	0	0	0	0	0	0	0	0	0	0	0
NPV	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
IRR	0	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Payback Period	0	2 years											

NPV	IRR	Payback Period
0	-10.0%	2 years

Based on result of Scenario #1, the next calculation will be for Scenario #2, where the calculation is to find the maximum camera price that customers can accept. In this Scenario #2, the calculation will be for the camera price which makes the NPV become 0 as shown in Table 10. Based on this scenario #2, the maximum price for camera part is IDR 157 Mill.

Table 10. Scenario#2 capital budgeting calculation

Mous	0	1	2	3	4	5	6	7	8	9	10	11	12
Operating Cost	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Discount Rate	0	0	0	0	0	0	0	0	0	0	0	0	0
NPV	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
IRR	0	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Payback Period	0	2 years											

NPV	IRR	Payback Period
0	-10.0%	2 years

Considering future potential for this project, the customers still has so many production lines that can use PT XYZ products, there will be Scenario#3. This scenario will give special price to customers with camera parts as IDR 140 Mill. For this special price, the NPV value will be IDR 16.55 Mill where the IRR will be 18.01%. The payback period result is 1.7 years. A positive value of NPV indicates that the earnings will exceed the anticipated costs and is a profitable investment. The complete result for this scenario can be seen in Table 11

Table 11. Scenario#3 capital budgeting calculation

Mous	0	1	2	3	4	5	6	7	8	9	10	11	12
Operating Cost	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Discount Rate	0	0	0	0	0	0	0	0	0	0	0	0	0
NPV	0	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000	-1,000,000
IRR	0	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Payback Period	0	2 years											

NPV	IRR	Payback Period
16.551.511	18.01%	1.7 years

Finally, the sensitivity analysis is carried out on 7 variables that act as input variables using downside, base, and upside condition state. The target financial indicator to be tested is NPV, where the analysis will see the changes of NPV in downside and upside condition as shown in Table 12.

Table 12. Variables movement to NPV

No	Variables	Downside	Input	Upside	NPV Result	Range
1	Production/Minute	10	20	30	17,000,000	16,481,511
2	Operator Wages	9,000,000	4,000,000	5,000,000	-3,519,194	16,540,511
3	Number of operator	2	1	0	-60,495,194	16,540,511
4	Product Price	650	750	850	-374,895,647	16,540,511
5	Material Cost	320	300	280	-57,566,690	16,540,511
6	Taxes	25	22	20	14,370,859	16,540,511
7	Camera Price	175,000,000	140,000,000	105,000,000	-18,456,469	16,540,511

Tornado chart lists the variables vertically, ordered based on the most important variables in shaping the sensitivity scenario. Through the tornado chart, it can be seen how maximum and minimum the risk can impact the NPV value as shown in Figure 10. A tornado chart is used to depict the sensitivity of a result to changes in selected variables.

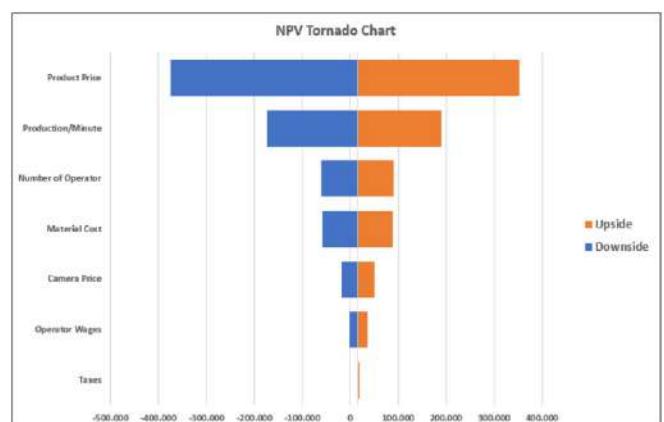
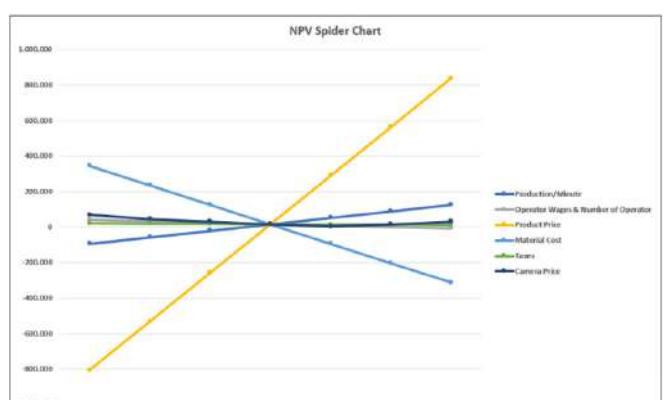


Fig. 10. NPV tornado chart

Another tool for sensitivity analysis is spider chart. Spider chart will display data based on single reference point (base scenario), the data length and position will determine which variables are the most important one in shaping the sensitivity scenario.



IV. DISCUSSION

A. Strategic and Tactical Action for Business Strategy

As already stated above on business strategy, there are several business strategies that PT XYZ Indonesia can do to improve their current situation. Strategies are developed from 4 ways in TOWS matrix. Considering COVID-19

situation where the social distancing is happening, factory automation implementation can be one of the solutions to minimize interaction between person to person. This is one the reason why PT XYZ Indonesia will focus to developing technologies that enable customers to remotely monitor and control the manufacturing process. In this case, it also includes IoT, Industry 4.0, traceability system, and Overall Equipment Effectiveness (OEE). Many manufacturing plants want to implement IoT, Industry 4.0, and OEE as their main standard for digitalization in factory and production processes.

Targeting the customers is also the important point when PT XYZ Indonesia want to expand their business. Currently, from internal research, PT XYZ Indonesia has quite strong market segment in Japanese automotive manufacturer. As the part of expanding the market, PT XYZ Indonesia will target for new segment in Electric Vehicle (EV), food beverages, and pharmacy. These 3 segment markets are quite arisen in recent years, especially in COVID-19 situation.

From market study, currently one Korean automotive player is the only player for EV in Indonesia. Another big player from Japanese automotive manufacturer also already has planning for Hybrid vehicle. In this case, PT XYZ Indonesia must do mapping for every parts supplier to these 2 EV players to get actual information about EV development in Indonesia.

As already stated above, F&B and pharmacy sectors quite increasing after COVID-19 situation. PT XYZ Indonesia must penetrate these new segments to expand their market in Indonesia. Before expanding this market, PT XYZ Indonesia must study which channel could provide them more projects. Besides that, these new segments must have different characteristics compare to automotive sectors.

Another point that PT XYZ Indonesia can do is hire expertise in marketing and build market research team to get more information about new segment target market. The company can hire expert in marketing area to get better knowledge and decide best action for the strategic action to expand their markets. In this case, the market can also include for SME and home industry segment which are the backbone of Indonesian domestic economy.

Lastly, PT XYZ Indonesia must point official partners as main integrator to promote single solution system. As already stated above, PT XYZ Indonesia cannot provide whole solution system for customers. So, that is the main reason to appoint the official partner to strengthen their position in customer's point of view. This method is customer-oriented approach to penetrate market easily by increasing the channels.

B. Bottleneck Phases in Sales Process Model

Basically, all of activities need to be inputted in our CRM system. Based on the data that already inputted by all sales engineers, management side of PT XYZ Indonesia can see and monitoring about these data. Implementation of this sales model already been done since December 2021 until today.

By using this model, the progress of total team and individual progress by sales members can be seen clearly. Management side of PT XYZ Indonesia can monitor and conclude the problem that every member faced in their daily sales activities. Management side can help their member and give them the best suggestion to handle the obstacles.

Based on the recorder data, the biggest bottleneck on the process is not the quantity aspects instead the quality aspects. It clearly can be seen from Q4-2021 data where the (C_App)/Application ratio was very small compared to other stages in the sales model. This problem happened to all sales engineer members and can be seen as red color for the conversion ratio on Figure 12.



Fig. 12. Sales model data Q4-2021

Based on the research, the root problem for this case is because the sales members cannot finalize the technical specification to customers in quick time. They took so much time in making the test report or proposal. It happened because they cannot operate the test unit correctly. Besides that, they do not have the report format to standardize the proposal quality.

After understanding fully about current bottleneck, PT XYZ Indonesia did the corrective action as the improvement point to solve this problem. Below are the 3 main improvement actions from management side

Table 13. Counter measure for C_App/Application bottleneck

No	Problems	Counter Measures
1	Long time for making the report	Training and mentoring from technical team
2	No standard for report quality	Establish proposal or test report format
3	No standard for technical configuration	Establish software as tools for technical configuration

C. Implementation of Sales Process Model in FY-2022

After understood the current situation and bottleneck, PT XYZ Indonesia implemented this new tool in March 2022 until now. They accumulate the data from March 2022 – May 2022. The data shows good improvement from all sales engineer members. The (C_App)/Application ratio improve from 27% to 52%. Besides that, because they can improve this stage, the sales amount that they get in the end also increase quite significant from IDR 2.970 Bill to IDR 7.316 Bill. Below are the data for Q1-2022:

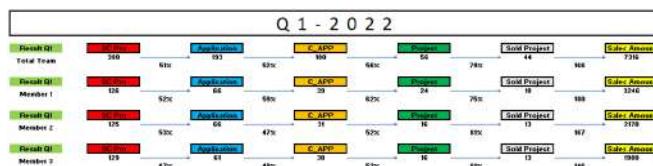


Fig. 13. Sales model data Q1-2022

Good result from Q1-2022 makes us to continue this sales model approach. Considering FY-2022 sales target, PT XYZ Indonesia will focus on the gathering application process right now. They need to accumulate many applications, so they can close it all also in this fiscal year. Below is the illustration for the strategy in remaining FY-2022.

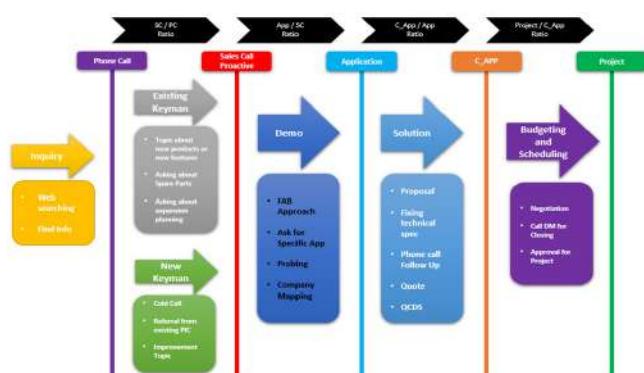


Fig. 14 Sales strategy in FY-2022

In this remaining FY-2022, PT XYZ Indonesia will try to separate the companies and contacts that they will approach. There will be target companies which they will focus more to be visited. Besides that, they also already have the contact list which called as Keyman. These Keyman hopefully can generate more applications.

For closing the project, PT XYZ Indonesia will empower Leader or Manager from to intervene current potential applications. These leaders or managers will contact also to Decision Maker from customer's side to get their opinion about current applications status. The key point in closing the project is about follow-up action where they will combine all resource to get higher sales amount to close this FY-2022 with good achievement.

D. Variables movement to NPV and Pricing Strategy

Based on tornado chart and spider chart in Figure 10 and Figure 11, item price of customers can give highest impact to the NPV value and taxes will not really impact the NPV value. As the seller, PT XYZ Indonesia must analyze about target product price from customers. They can compare their camera system product with customer's item price. This approach can be done by the sales engineer by ask more deeply to customers. Besides that, production capacity from customers also will play important thing to pricing method. These 2 main factors will be the main consideration from customers side to buy automation product. In this case, in future seller must train their members to get correct information about customer's item price and their production capacity.

Pricing plays a strategic role in B2B segments. For this pricing strategy, PT XYZ Indonesia will conduct value-based pricing strategy. Price would be decided accurately based on the value of the product and the price that the customer is willing to pay for them. Value pricing is customer-focused pricing, meaning companies base their pricing on how much the customer believes a product is worth. Below is the illustration of value-based pricing:

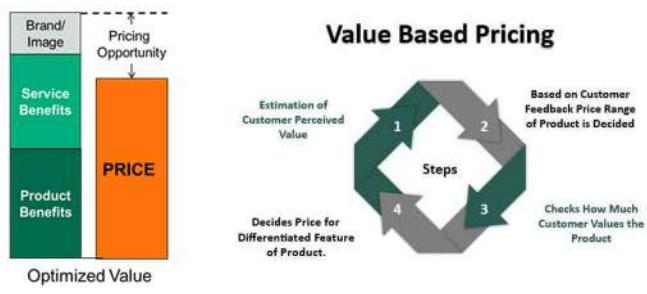


Fig. 15 Value based pricing

This strategy may need complex step and intensive communication with customers. By adopting this strategy, PT XYZ Indonesia can avoid pricing their product higher than what customers are prepared to pay or lower than they will pay. By using effective sales and marketing techniques, they can educate the customers, so customers will have better understanding about the value of automation products.

In this case, the range price for automation products is IDR 120 Mill – IDR 160 Mill. As the company, PT XYZ Indonesia want to keep their profit as high as possible. They believe that IDR 120 Mill is the lowest price that they can give to customer. On other side, IDR 160 Mill is the maximum price that customer can afford based on the investment calculation that already conducted in the previous chapter. This range will help the salespeople to conduct the negotiation with customers. Below is the tactical strategy that PT XYZ can do for the implementation of value-based pricing strategy:

1. Probing and collect data about the customers with much detail. In this step, salesperson must get the important information such as manufacturing cost, profit, production capacity, etc.
2. Confirm the data by management side from PT XYZ Indonesia. In this case, they can assign sales leader or sales manager to contact to decision maker from customers to confirm about the situation
3. Finalize technical specification based on customer's inquiry. PT XYZ Indonesia need to solve customer's problems, so that's why the specification must answer and solve current problematic situation.
4. Decide minimum and maximum price. In this case, salesperson may need apply for special price to management side to proceed for this project.
5. Confirm the maximum price to customer's side. By telling them about the price, salesperson can see customer's reaction. By this way, salesperson can check how much the customer values the output.
6. Negotiate to customers until get the best price in the price range. In this case, intensive communication might be needed from seller's side to customer's side

V. CONCLUSION

The conclusion of this paper is per following:

1. PT XYZ Indonesia must implement correct business strategy to scale up the business and capture the business opportunities. Below is the specific action for the business strategy:
 - o Utilize direct sales strategy with three approaches: direct approach, comprehensive support, and fast delivery
 - o Hire expertise in marketing area
 - o Focus to specific sensor items such as camera vision, laser sensor, and safety sensor
 - o Choose official partners as main integrator to promote single solution system
 - o Expand to automotive EV, food beverage, and pharmacy
2. Implement suitable sales modelling approach for B2B sales strategy. The stages are Phone Call, Sales Call, Application, C_App, Project, Sold Project, and Sales Amount.

3. Implement value-based pricing based on investment calculation. In this case, the price range for camera inspection is within IDR 120 Mill – IDR 160 Mill. By implement these prices, seller still get the profit amount that they desire, and customer still get the suitable productivity benefit in their factories
4. Customer's product price, production capacity, and material cost are the main variables that are quite sensitive to NPV value movement. As seller, PT XYZ Indonesia need to train the sales engineer to get correct information about these variables to implement best pricing strategy to customers.

VI. SUGGESTION

There are still so many improvements that PT XYZ Indonesia can do to strengthen their brand in factory automation industry. Below are the suggestions:

- o Research about market expansion to other big industries outside automotive
- o Research about marketing strategy for B2B factory automation segment
- o Establish "farmer" and "hunter" for the sales team
- o Exploration of human capital development
- o Trial new method to improve conversion ratio in sales process modelling
- o Develop plain truth reporting and real time updating in CRM system
- o Develop new simple calculation proposal tools
- o Establish portfolio bank for specialized industrial segments

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Paper 20

The Effect of Hijab Worn by Influencers in Muslim Fashion Product Endorsement Through Instagram Towards Purchase Intention

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ICMEM

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Abstract - Nowadays, there is a wide range of influencers that can be chosen as a promotion agent in conducting product endorsements through social media. Hence, it could be a challenge for businesses to choose the appropriate influencer to promote their products, including Muslim fashion business. This research aims to find out whether an influencer who wears hijab in Muslim fashion product endorsement looks favorable to Muslim consumers, as well as whether the hijab worn by the influencer affect purchase intention. The data for this research is collected through online survey and analyzed with PLS-SEM in order to determine the relationship between the research variables. The result shows that perception towards appearance has a positive influence on the attractiveness, trustworthiness, and expertise of an influencer. Both trustworthiness and expertise is also found to have a positive influence on consumer attitude, which leads to a positive influence towards purchase intention. The findings of this research are expected to provide insights for future researchers and Muslim fashion business marketers regarding the perception of consumers towards Muslim fashion product endorsement through social media.

Keywords - Consumer Attitude, Hijab, Influencer, Instagram, Muslim Fashion, Perception Towards Appearance, Product Endorsement, Purchase Intention, Source Credibility

I. INTRODUCTION

Muslim fashion business belongs to an industry that shows a great potential in Indonesia as a country with the most population of Muslims in the world. As of December 31st 2021, the Muslim population of Indonesia reaches 237.53 million people, which is equal to 86.9% of the total population in Indonesia [1]. Therefore, in order to successfully capture this large market, it is important for Muslim fashion business to conduct its marketing based on the preferences of Muslim people, one of them is regarding the influencer marketing on Instagram as one of the latest methods to promote products and services.

Influencer marketing is closely linked with social media as influencers need social media as a platform to gain popularity, whereas social media is seen by the public as appealing because of the contents that are posted regularly by influencers. Influencer marketing itself is a very prospective method of marketing as it constitutes

a \$10 billion industry in 2020, thus increasing relevance for many companies to utilize marketing with the help of influencers [2]. Influencer marketing is a form of marketing that emphasizes on particular key people instead of the target market entirely, because these people are recognized as potential customers. It can be inferred that influencer marketing includes all the marketing activities performed by these influencers [3].

Nowadays, there are many influencers available to be chosen as promotion agents. As a business that aims to reach Muslim consumers, Muslim fashion business should consider carefully which influencers would look more favorable in the eye consumers. When the influencers are seen as favorable, consumers would consider to purchase the products that are being promoted by the influencers. On the other hand, when the influencers are not seen as favorable, customers would not be interested in purchasing the products that are promoted. One of the factors that might influence the customers to decide whether an influencer is seen as favorable or not is the appearance, where influencers with hijab as a clothing attribute that are familiar for Muslims might be perceived as more positive by customers. Therefore, this research aims to explore whether influencers who wear hijab would look favorable to Muslim consumers in terms of Muslim fashion product endorsement. In addition, this research also aims to explore whether the hijab worn by the influencers affects purchase intention.

II. LITERATURE REVIEW

A. Influencer Marketing

Influencer marketing can be defined as a form of marketing where brands ask influencers to endorse their products on social media in which these brands have control over the content, and in return, there will be a compensation in the form of free products or financial payment received by these influencers [4].

B. Hijabi Influencers

Influencers who wear hijab as an Islamic symbol might enhance the information processing and persuasion during product endorsements as the audience perceived a sense of likability, familiarity, or similarity with the influencer [5]. Muslim consumers might find some association or relationship with hijabi influencers because hijab as an Islamic symbol reminds them of their religion.

C. Perception Towards Appearance

The physical appearance of influencers presents a visual testimony for product effectiveness, thus creating a persuasion towards the audience [6]. Prior studies suggested that the perception towards appearance can influence attractiveness, trustworthiness, and expertise of a person [7][8].

D. Source Credibility

Source credibility is defined as the positive characteristics that influence the acceptance of a message by the receiver [9]. There is a higher possibility for people to be persuaded in buying a product or service when the source of information is perceived as credible. The three dimensions of source credibility are attractiveness, trustworthiness, and expertise, which are then divided into thirteen sub-dimensions as shown in the following figure.

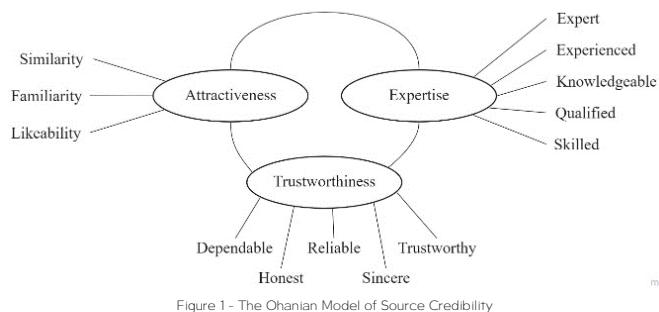


Figure 1 - The Ohanian Model of Source Credibility

E. Attractiveness

The attractiveness dimension in source credibility model is related to the familiarity, likability, and similarity of the source, in this case the influencer, which could affect the effectiveness of a message delivered to the audience [9]. Familiarity can be defined as the audience's knowledge regarding the influencer, likability as the audience's affection towards the influencer, and similarity as the perceived resemblance between the audience and the influencer [10].

F. Trustworthiness

Trustworthiness can be defined as the degree of confidence and acceptance perceived by the consumers towards the influencers and the message [9]. Trustworthiness includes the perceived dependability, honesty, and reliability of an influencer [6]. Thus, it can be inferred that influencers who possess these attributes are perceived as trustworthy.

G. Expertise

Expertise can be defined as the extent of perception by consumers towards an influencer as a source of credible assertions, which includes the knowledge, experience, or

skills owned by the influencer [6]. In the context of source credibility, the expertise is emphasized on how consumers perceive an influencer, regardless the real expertise of the influencer [11]. In this case, the expertise of hijabi influencers is seen through whether they are perceived by the audience to have a good sense of fashion and an extensive knowledge about fashion, specifically in Muslim fashion.

H. Consumer Attitude

Consumer attitude can encourage behavioral intentions, which then leads into actual purchases [12]. Consumer attitude is one of the factors that could affect brand image and consumer buying behavior, and thus marketers could change the consumer attitude through various marketing strategies [13]. Consumer attitude is essential to be understood by researchers and managers as it could influence consumer tendencies towards a specific behavior [14].

I. Purchase Intention

Purchase intention is closely linked to the attitude, perception, and behavior of consumers [15]. The Theory of Planned Behavior suggests that when intention is increasing, it indicates that the possibility of implementing the behavior is also increasing. In the context of influencer endorsement, consumer attitude on a particular brand is directly affecting purchase intention [16].

J. Hypothesis Development

Based on the previous studies, there are several models that could be adapted to construct the conceptual framework for this research. Attractiveness, trustworthiness, and expertise of hijabi influencers are found to have a significant effect towards purchase intention [17]. Utilizing hijab as an Islamic symbol is also found to be important as it could lead to positive attitude towards the advertisement for Muslim consumers [15]. Furthermore, perception towards hijab as appearance is found to positively influence both attractiveness and trustworthiness, thus hijabi beauty gurus are perceived as more favorable by Muslim consumers when compared to non-hijabi beauty gurus [18]. Therefore, the conceptual framework for this research is constructed as follows.

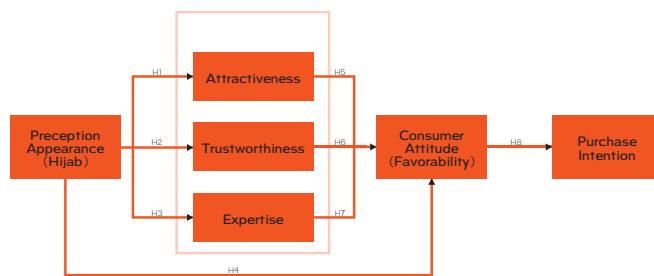


Fig. 2. Conceptual Framework

By using hijab as an Islamic symbol, influencers might enhance the persuasion during product endorsements through an identification process as the audience perceived a sense of attractiveness in the influencer, including likability, familiarity, or similarity [5]. Therefore:

H1: Perception towards appearance (hijab) has a positive influence on the attractiveness of an influencer

Religious people are perceived to be more trustworthy by the audience compared to non-religious people [19]. One important way to express someone's religious identity is by wearing religious dress and symbols [20]. Wearing a religious symbol could reflect the compliance to one's religious belief and the desire to be publicly perceived as religious [5]. Hence:

H2: Perception towards appearance (hijab) has a positive influence on the trustworthiness of an influencer

The appearance of a spokesperson could affect the perception of audience regarding the expertise of the spokesperson [8]. Affective symbols, including religious symbols, could influence motivation by the audience, either consciously or unconsciously [21]. Religious symbols are also found out to be persuasive in generating stronger perception of perceived source expertise [22]. Influencers who wear hijab might persuade Muslim audience, either consciously or unconsciously, to perceive the influencer as experts, specifically in Muslim fashion. Thus:

H3: Perception towards appearance (hijab) has a positive influence on the expertise of an influencer

Hijab as an Islamic symbol represents and reminds Muslims of their religion, including its implications and orders. Hence, utilizing hijab as an Islamic symbol could have a significant influence in forming Muslims' attitudes towards advertisements, including product endorsement [5]. Hijab as an Islamic symbol has influenced Muslim audience to generate positive attitude regarding the product endorsed, where hijab could be a trigger for consumers to also perceive the product as halal [23]. Therefore:

H4: Perception towards appearance (hijab) has a positive influence on consumer attitude (favorability)

When a source is perceived as more attractive, the audience will also see the message as more persuasive [24]. The attractiveness dimension in source credibility model is related to the familiarity, likability, and similarity of the source [9]. Likability, familiarity, and similarity of an endorser are also linked to the effectiveness of a message [25]. The audience of a product endorsement has a belief where people have a tendency to agree with someone they like [5]. When an influencer is perceived as

likeable, which is one of the attractiveness attributes, the audience will generate a positive attitude towards the advertisement. Thus:

H5: The attractiveness of hijabi influencers has a positive influence on consumer attitude (favorability)

When a communicator is perceived to have a high trustworthiness, a message with the opinion from the communicator is more effective in producing a change of consumer attitude than a message with no opinion from the communicator [9]. Truth, honesty, politeness, social obligations, and collective responsibilities are some of the values that should be followed by Muslims [5]. Therefore, in performing product endorsement, an influencer should not lie and also avoid exaggeration in order to be perceived as trustworthy, especially by Muslim audience. Hence:

H6: The trustworthiness of hijabi influencers has a positive influence on consumer attitude (favorability)

Product evaluations that are done based on source expertise are generally seen as relevant [26]. Therefore, source expertise is often considered by consumers to evaluate whether a product endorsement is valid or not [27]. Furthermore, as experts are believed to have the appropriate knowledge and able to provide an honest review regarding the product endorsed, consumers might evaluate a product based on the source expertise only [28]. Therefore:

H7: The expertise of hijabi influencers has a positive influence on consumer attitude (favorability)

When there is an Islamic symbol presented in an advertisement, such as hijab, there is a positive attitude shown by the audience, which will eventually lead to purchase intention [23]. Consumer attitude (favorability) based on a product endorsement with hijabi influencers has a positive relationship with purchase intention [18]. Moreover, in the context of influencer marketing, purchase intention is directly influenced by consumer attitudes [16]. Hence:

H8: Consumer attitude (favorability) based on product endorsements by hijabi influencers has a positive influence on purchase intention

III. METHODOLOGY

A. Research Design

Research design is defined as a roadmap, blueprint strategy, and plan of conducting an investigation that are properly conceived in order to discover answers to the previously constructed research questions [29]. In

this research, there are 6 main phases which summarizes the research activities conducted, which are problem identification, literature review, data collection, discussion and analysis, and conclusion and recommendation.

B. Research Approach

In this study, the researcher will use quantitative approach by conducting online survey. The quantitative research method involves the quantification and analysis of variables with numerical data in order to get results that will answer the research questions [30]. There are several types of quantitative research methods, which are survey research, correlational research, experimental research, and causal-comparative research [30]. This research will utilize the survey research as one of the quantitative methods.

Survey method is defined as a structured questionnaire that is given to a sample population in order to obtain a certain information from the respondents [31]. Survey method can be used to gather information that represents the characteristics of a target population in a relatively short amount of time [32]. Survey method includes sampling of a target population, designing questionnaire, administering questionnaire, and analyzing data in order to gain a deeper understanding and predict some aspects of the behavior of a target population [33].

C. Data Collection

The population of this research is Muslim women as the target audience for Muslim fashion products endorsed by influencers who wear hijab. While there are no data available regarding the number of Muslim women in Indonesia, the data from the Ministry of Internal Affairs revealed that there are 238.09 million or 86.93% of Indonesian citizens whose religion are Muslim, and there are 135.57 million or 49.5% of Indonesian citizens who are women by the end of 2021 [34]. The minimum sample size in marketing research studies is 200 respondents [31]. Hence, there should be a minimum of 200 respondents collected for the online survey in this study with the criteria of Muslim women.

The sampling technique that is used in this research is purposive sampling. Purposive sampling involves the researcher's judgement in selecting the appropriate units, including people, case/organizations, events, or pieces of data, that are studied [35]. Out of the 104 million Instagram users in Indonesia, the top two largest Instagram user groups in January 2022, specifically for women, are women aged 18-24 years old and 25-34 years old [36]. Therefore, Muslim women with the age of 18-34 years old who have used Instagram in the last month is chosen as the sample for this study.

D. Data Analysis

The data that is collected for this research is analyzed by using PLS-SEM. PLS-SEM is an analysis method that allows researchers to estimate complex models with many indicator variables, constructs, and structural paths without having to impose distributional assumptions on the data [37]. By using PLS-SEM analysis, the researcher can gain valuable insights regarding the strength and significance of relationships in the hypothesis model [38]. Furthermore, PLS-SEM has been used to estimate cause-effect relationship in complex models with latent variables in various business research topics [39].

IV. RESULTS

The data for this research is collected from 212 respondents who are Muslim women with the age of 18-34 years old and have used Instagram in the last month.

A. Reliability Test

The reliability of each variable in this research is assessed by using the internal consistency test, where the variable reliability is determined based on the composite reliability values. In order for the variables to be reliable, the composite reliability value should be more than 0.7 [40]. The result of the internal consistency test is presented in the following table

Table 1 - INTERNAL CONSISTENCY RELIABILITY RESULT

Variables	Composite Reliability	Reliability
Perception towards Appearance	0.812	Reliable
Attractiveness	0.921	Reliable
Trustworthiness	0.897	Reliable
Expertise	0.904	Reliable
Consumer Attitude	0.830	Reliable
Purchase Intention	0.886	Reliable

Table 1 shows that all the composite reliability values are greater than 0.7, thus all the variables in this research are reliable.

B. Validity Test

In order to conduct the validity test, the convergent validity and the discriminant validity should be assessed. The convergent validity is measured based on the Average Variance Extracted (AVE) values. The AVE values should be a minimum of 0.5 in order for the variables to be valid [40]. The result of the convergent validity test is presented in the following table.

Table 2 - CONVERGENT VALIDITY TEST

Variables	Average Variance Extracted (AVE)	Validity
Attractiveness	0.591	Valid
Consumer Attitude	0.700	Valid
Expertise	0.636	Valid
Purchase Intention	0.654	Valid
Perception towards Appearance	0.620	Valid
Trustworthiness	0.613	Valid

According to Table 2, the AVE values of each variable are more than 0.5, thus all the variables are valid based on the convergent validity.

Similar to the convergent validity, the discriminant validity is also measured by the AVE values, where the AVE square root value of each variable should be greater than the correlation between the variables [41]. The result of the discriminant validity test is presented in the following table.

Table 3 - DISCRIMINANT VALIDITY TEST

	Attractiveness	Consumer Attitude	Expertise	Purchase Intention	Perception towards Appearance	Trustworthiness
Attractiveness	0.769					
Consumer Attitude	0.487	0.873				
Expertise	0.480	0.634	0.798			
Purchase Intention	0.425	0.587	0.483	0.809		
Perception towards Appearance	0.572	0.553	0.540	0.384	0.790	
Trustworthiness	0.490	0.687	0.610	0.529	0.530	0.783

According to Table 3, the AVE square root values of each variable, which are written in bold, are greater than the correlation between the variables. Therefore, all the variables are valid based on the discriminant validity.

C. Collinearity Test

The collinearity test is conducted in order to avoid collinearity issues. The collinearity between variables are determined by the Variance Inflation Factor (VIF) values, where the VIF value should be less than 5 [40]. Based on the PLS-SEM result, the VIF values of all the indicators are less than 5. Hence, there are no collinearity issues found between the variables in the research model.

D. Structural Path Significance

The structural path significance involves the bootstrapping procedure, where the significance of both the inner and outer model is assessed based on the T-statistics value. The T-values that are obtained from the bootstrapping method will determine the relationship between the variables, where the path coefficient is considered as significant if the T-statistics has a minimum value of 1.96 [40]. The bootstrapping result is presented in the following figure.

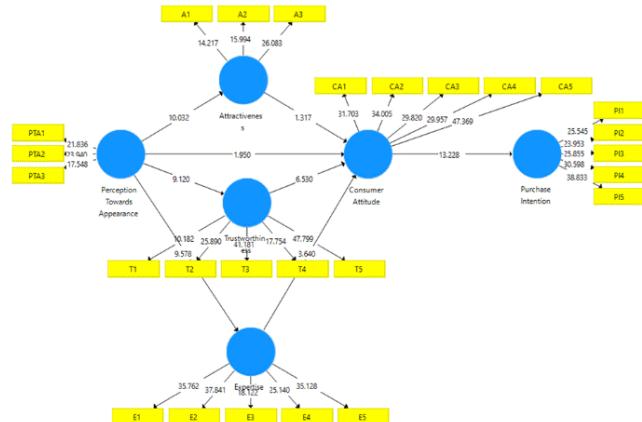


Fig. 3. Bootstrapping Result

As shown on Fig. 3, there are two structural paths that have a T-statistics value lower than 1.96, which are "Perception Towards Appearance -> Consumer Attitude" with a value of 1.950 and "Attractiveness -> Consumer Attitude" with a value of 1.317. Thus, these structural paths are not significant. The other structural paths are significant as the T-statistics values are greater than 1.96.

In addition, the result of R^2 (coefficient of determination) and Q^2 (cross-validated redundancy) test based on the PLS-SEM analysis result in a GoF (Goodness of Fit) value of 0.136. As the minimum score of GoF is 0.1, the GoF value in this research fits the criteria and the research model can explain the empirical data.

E. Hypothesis Testing

The hypothesis testing is conducted based on PLS calculation, where the path coefficient and T-values result will determine the significance of each hypothesis. The result of the hypothesis testing is presented in the following table.

Table 4 - HYPOTHESIS TESTING RESULT

Hypothesis	Structural Path	T Statistics	P Values	Result
H1	Perception Towards Appearance -> Attractiveness	10.032	0.000	Accepted
H2	Perception Towards Appearance -> Trustworthiness	9.120	0.000	Accepted
H3	Perception Towards Appearance -> Expertise	9.578	0.000	Accepted
H4	Perception Towards Appearance -> Consumer Attitude	1.950	0.052	Rejected
H5	Attractiveness -> Consumer Attitude	1.317	0.189	Rejected
H6	Trustworthiness -> Consumer Attitude	6.530	0.000	Accepted
H7	Expertise -> Consumer Attitude	3.640	0.000	Accepted
H8	Consumer Attitude -> Perception Towards Appearance	13.228	0.000	Accepted

As shown on Table 4, the hypothesis testing result shows that H1, H2, H3, H6, H7, and H8 have a T statistics value that is higher than 1.96 and a P value that is lower than 0.05. Therefore, these hypotheses are accepted. On the other hand, H4 and H5 have a T statistics value that is lower than 1.96 and a P value that is higher than 0.05. Hence, these hypotheses are rejected.

F. Total Indirect Effect and Total Effect

The total indirect effect and total effect can be calculated based on the bootstrapping result. The total effect result is shown in the following table.

Table 5 - TOTAL EFFECT RESULT

	Original Sample (O)
Perception towards Appearance -> Purchase Intention	0.325
Attractiveness -> Purchase Intention	0.042
Trustworthiness -> Purchase Intention	0.239
Expertise -> Purchase Intention	0.158
Consumer Attitude -> Purchase Intention	0.587

Based on Table 5, it can be concluded that perception towards appearance affects purchase intention through attractiveness, trustworthiness, expertise, and consumer attitude by 32.5%; attractiveness affects purchase intention through consumer attitude by 4.2%; trustworthiness affects purchase intention through consumer attitude by 23.9%; expertise affects purchase intention through consumer attitude by 15.8%; and consumer attitude affects purchase intention by 58.7%.

V. DISCUSSION

Hypothesis 1 is regarding the relationship between perception towards appearance (hijab) and the attractiveness of an influencer. Based on the data analysis result, this hypothesis is accepted. This is aligned with a previous study, which stated that influencers who wear hijab as an Islamic symbol during product endorsements are perceived as attractive by consumers, thus it might enhance the persuasion towards consumers [5]. Muslim consumers might find some association or relationship with hijabi influencers, which eventually leads the consumers to perceive the influencers as attractive. Moreover, as the first hypothesis is accepted, it also supports a previous study, which revealed that there is a higher possibility for consumers to be influenced when they feel a sense of similarity with the influencer [24]. Similarity is one of the attributes of attractiveness, along with likability and familiarity. When consumers see that an influencer has similarity with them, especially in terms of appearance, the influencer will be perceived as more attractive [7]. In this case, the similarity that Muslim consumers might find in hijabi influencers is regarding the use of hijab as a clothing attribute and the religion as a Muslim. This has caused Muslim consumers to perceive

the hijabi influencer as attractive.

Hypothesis 2 is regarding the relationship between perception towards appearance (hijab) and the trustworthiness of an influencer. Based on the data analysis result, this hypothesis is accepted. This supports a previous study which revealed that people who looks religious are perceived to be more trustworthy by consumers compared to non-religious people [19]. In addition, wearing a religious symbol could reflect the compliance to one's religious belief and the desire to be publicly perceived as religious [5]. In this study, the religiosity of the influencer is represented with the use of hijab as an Islamic symbol. Based on their appearance, the hijabi influencers are perceived as more religious by consumers, thus they are also perceived as more trustworthy, specifically in Muslim fashion product endorsements. Therefore, it can be inferred that wearing hijab as an Islamic symbol is an important aspect in conducting Muslim fashion product endorsements as it can influence the trustworthiness of the influencer in the eye of consumers.

Hypothesis 3 is regarding the relationship between perception towards appearance (hijab) and the expertise of an influencer. Based on the data analysis result, this hypothesis is accepted. This is aligned with a previous study which revealed that the appearance of a spokesperson could affect the perception of audience regarding the expertise of the spokesperson [8]. The acceptance of the third hypothesis also supports a previous study which stated that religious symbols are persuasive in generating stronger perception of perceived source expertise [22]. The result of this study shows that influencers who wear hijab as an Islamic symbol are perceived to be experts by consumers in conducting Muslim fashion product endorsements. The expertise of hijabi influencers is seen through whether they are perceived by the audience to have a good sense of fashion and an extensive knowledge about fashion, specifically in Muslim fashion. Therefore, it is important for influencers to pay attention to their appearance in conducting Muslim fashion product endorsements, not only by wearing hijab, but also by showing that they have a good sense of fashion in order to be perceived as experts by consumers.

Hypothesis 4 is regarding the relationship between perception towards appearance (hijab) and consumer attitude. Based on the data analysis result, this hypothesis is rejected. A previous study shows a similar result, where there is no direct effect found between perception towards appearance and consumer attitude, specifically in terms of favorability [18]. Although a previous study revealed that wearing hijab as an Islamic symbol could have a significant influence in forming Muslim consumer attitude towards the advertisement [5], the findings of

this study shows that there is no significant influence between influencers wearing hijab and consumer attitude towards the brand. This indicates that it is not enough for influencers to only wear hijab if the goal is to generate a positive consumer attitude towards the brand. Hence, instead of choosing a random influencer who wears hijab to promote their products, a Muslim fashion business should also consider other aspects, such as the credibility of the influencer, in order to generate a positive consumer attitude towards the brand.

Hypothesis 5 is regarding the relationship between the attractiveness of hijabi influencers and consumer attitude. Based on the data analysis result, this hypothesis is rejected. This result is in contrary with the findings of previous studies. A previous study revealed that the attractiveness of an endorser has a positive influence on consumer attitude towards the brand [25]. Another study also found that physical attractiveness has a positive relationship on consumer attitude towards the advertisement [42]. Moreover, the attractiveness of an influencer has a significant influence in generating a positive attitude from consumers [43]. On the other hand, the researcher has not find any study that has a similar finding with the result of this study. Therefore, it can be inferred that the result where attractiveness does not have a significant influence towards consumer attitude might be specific only in the case of Muslim fashion product endorsement. The possible reason why the result of this study is different with the result of previous studies that are mentioned above is because attractiveness is perceived as important by consumers in evaluating many products, such as ring, motorbike, fabric softener, milk, and chocolate wafer. However, Muslim fashion product is not one of them as the findings of this study revealed that the attractiveness of an influencer is perceived as not important by consumers in evaluating a Muslim fashion brand. There might be other aspects that are considered as more important by consumers in evaluating a Muslim fashion brand, such as trustworthiness and expertise.

Hypothesis 6 is regarding the relationship between the trustworthiness of hijabi influencers and consumer attitude. Based on the data analysis result, this hypothesis is accepted. This supports a previous study which stated that a trustworthy communicator who delivers a message with their own opinion is found to be effective in producing a change in consumer attitude [9]. In this study, the trustworthy communicator is the hijabi influencer who conduct Muslim fashion product endorsements through Instagram. The hijabi influencer should include their own opinion in conducting the product endorsement in order to positively influence consumer attitude. Furthermore, truth and honesty are important values that should be followed by Muslims [5]. These values might influence the perception of Muslim consumers towards product

endorsements. Hence, it is important for influencers to maintain truth and honesty in conducting Muslim fashion product endorsements in order to be perceived as trustworthy by the consumers.

Hypothesis 7 is regarding the relationship between the expertise of hijabi influencers and consumer attitude. Based on the data analysis result, this hypothesis is accepted. This is aligned with a previous study which stated that consumers tend to see a product endorsement as relevant when the endorser is an expert [26]. This indicates that an influencer with a higher expertise as perceived by consumers will have a positive influence on consumer attitude. In addition, this hypothesis result also supports a previous study which suggests that when an influencer is believed to have a high expertise, consumers might only rely on the source expertise in evaluating a product because the influencer is believed to have the appropriate knowledge and able to provide an honest review regarding the product endorsed [28]. In other words, the expertise of an influencer in a product endorsement has a positive influence on consumer attitude in evaluating a product. Therefore, it is important for Muslim fashion businesses to select an influencer with a high expertise to promote their products in order to generate a positive consumer attitude.

Hypothesis 8 is regarding the relationship between consumer attitude and purchase intention based on product endorsements by hijabi influencers. Based on the data analysis result, this hypothesis is accepted. This supports a previous study which revealed that consumer attitude (favorability) based on a product endorsement with hijabi influencers has a positive relationship with purchase intention [18]. Another study also stated that there is a positive attitude shown by the audience when an Islamic symbol is presented in an advertisement, which will eventually lead to purchase intention [23]. Furthermore, a previous study suggests that consumer attitude has a direct influence towards purchase intention in the context of influencer marketing [16]. Hence, it is important for Muslim fashion businesses to create a product endorsement strategy that can generate positive consumer attitude because it will have a direct influence towards purchase intention. The product endorsement strategy should involve an influencer who has a high trustworthiness and expertise, as these two attributes are found to have a positive influence towards consumer attitude.

VI. CONCLUSION

Based on the research findings, Muslim consumers have a positive perception towards influencers who wears hijab in Muslim fashion product endorsement through Instagram. This can be seen from the hypothesis testing

result, where perception towards appearance of the influencer in the form of hijab significantly influence the attractiveness, trustworthiness, and expertise of the influencer as attributes of source credibility. This indicates that an influencer who wears hijab is perceived as credible by Muslim consumers in conducting Muslim fashion product endorsement. The source credibility of an influencer is important because when an influencer is perceived as credible, there is a higher possibility to persuade consumers to purchase the product shown in an endorsement.

In the proposed research model, the relationship between perception towards appearance (hijab) and purchase intention is connected through several mediating variables, which are attractiveness, trustworthiness, expertise, and consumer attitude. Based on the hypothesis testing result, perception towards appearance of an influencer in the form of hijab has a significant influence towards attractiveness, trustworthiness, and expertise. However, perception towards appearance does not have a significant influence towards consumer attitude. This indicates that consumers do not show a positive attitude towards the brand after seeing Muslim fashion product endorsement by influencers who wear hijab.

While attractiveness has no influence towards consumer attitude, both trustworthiness and expertise have a significant influence towards consumer attitude. Hence, it can be inferred that although perception towards appearance does not have a direct influence towards consumer attitude, it has an indirect influence towards consumer attitude through trustworthiness and expertise. Furthermore, the result of this study revealed that consumer attitude has a significant influence towards purchase intention. Therefore, it can be concluded that perception towards influencers who wear hijab in Muslim fashion product endorsement through Instagram have a positive indirect influence towards purchase intention through trustworthiness, expertise, and consumer attitude. Attractiveness does not have a mediation effect between perception towards appearance and purchase intention as it has no significant influence towards consumer attitude.

Based on the overall research findings, there are some recommendations for Muslim fashion business owners or marketers that want to use influencer marketing to promote their products, as well as for future research with a similar topic. Muslim fashion business owners or marketers should select the appropriate influencer in conducting product endorsement through Instagram as it could affect purchase intention. Based on the research findings, when an influencer wears hijab in conducting a product endorsement, consumers will perceive the influencer as credible. The source credibility of an influencer is important because it could persuade consumers to purchase the

product shown in an endorsement. Hence, influencers who wear hijab should be selected in conducting Muslim fashion product endorsements.

Besides paying attention to the appearance of the influencer, it is also important to select an influencer who has a high trustworthiness and expertise in conducting Muslim fashion product endorsement as these two attributes have a significant influence towards consumer attitude. The attributes that should be evaluated in order to measure the trustworthiness of an influencer are dependability, honesty, reliability, sincerity, and trustworthiness. Conversely, the attributes that should be evaluated in order to measure the expertise of an influencer are expertise, experience, knowledge, qualification, and skill. By selecting an influencer with a high trustworthiness and expertise, consumers will show a positive attitude towards the brand, which then leads to purchase intention.

For future research, there are some recommendations in order to enrich the research findings and improve the quality of the research. First, the findings of this research is limited based on Muslim fashion product endorsements that are conducted through Instagram. Therefore, future research should try to examine the effect of product endorsements that are conducted through other social media platforms, such as TikTok, Twitter, and Youtube as the result may be different from the product endorsement through Instagram. Second, this research only focus on consumers' perception towards appearance of influencers in the form of hijab. Hence, future research could try to investigate consumers' perception towards appearance in other forms, and whether it has a significant effect towards source credibility, consumer attitude, and purchase intention. Third, future research could also modify the research framework by finding other variables that may mediate the relationship between perception towards appearance and purchase intention.

From a managerial perspective, the findings of this research can provide insights for Muslim fashion business owners or marketers to select the appropriate influencer for conducting product endorsement through Instagram as one of the latest methods to promote products and services. By selecting the appropriate influencer to conduct product endorsements, consumers will show a positive attitude towards the brand, which then leads to purchase intention. Hence, the sales of Muslim fashion products can be maximized through product endorsement strategy with the appropriate influencer.

From a theoretical perspective, this research contributes to enrich previous research findings by examining the effect of perception towards appearance, specifically hijab, towards purchase intention mediated by source credibility (attractiveness, trustworthiness, expertise)

and consumer attitude. This study may also be used as a reference for future research to develop a more complete research model regarding the influence of perception towards appearance on purchase intention.

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Paper 21

Generation Z Consumer Attitudes towards Video
Advertisement of TikTok in the E-Commerce Industry

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Abstract - Through decades of the technological era, online advertisements have become one of the most prevalent tactics for many marketers, especially for E-Commerce corporations. Therefore, this research examines the impact of online video advertising of the E-Commerce industries on Indonesians aged 18-25, particularly on the TikTok social media platform.

This research is based on Yang et al. [91] and Burhan [12] studies of YouTube Advertising Attitudes Model. This study explores essential factors influencing online consumers' attitudes: entertainment, informativeness, irritation, and credibility. In addition, the research also explores elements that affect consumer intentions and behaviour of E-Commerce ads on TikTok.

The discoveries of this study demonstrate that entertainment, irritation and credibility have a significant influence on attitudes towards E-Commerce companies' ads on TikTok, while Informativeness doesn't. Additionally, Attitude toward the video ads also significantly affects consumer intention to watch the ads. Lastly, the flow of using TikTok does not significantly affect both intention and behaviour of watching the ads. Furthermore, managerial implications are discussed further in this research

Keywords - Attitudes, Behaviour, Flow, Intention, Online Video Advertisement, Theory of Reasoned Action, TikTok

I. INTRODUCTION

A. Research Background

Through decades of the technological era, humans began to develop many ways to fulfil their needs. Business worldwide has competed and developed many innovations to satisfy customer needs, with technology being their most significant asset. One of the most popular business models in the modern world is E-Commerce. E-commerce was founded in the 1960s as corporations enforced the usage of EDI or Electronic Data Interchange as an instrument to swap data with other institutions. Furthermore, corporations' electronic networks continued to rise in the 1980s until they grew exponentially in the 1990s, with eBay and Amazon surging in North America. Electronic commerce or e-commerce is now regarded as a very influential concept that has transformed the present business environment.

E-Commerce then claims its popularity in the 21st century globally; it was estimated in 2021 that 2.14 billion individuals were shopping online to buy both services and goods, with Indonesia being one of the biggest markets. In 2021, Indonesia was the ninth most abundant market for E-Commerce [27]. With a 32% growth, the country's E-Commerce market has contributed to the global expansion rate of 29% last year [27].

However, even the biggest E-Commerce companies are beginning to struggle to keep their market share as more and more corporations are entering the market. With such a fast-growing and competitive market, E-Commerce companies are getting more challenged every day, so new brilliant marketing strategies are necessary. One of the marketers' most prevalent marketing techniques is by using advertising, especially online advertising. But, of course, making good and effective online advertising is already a big challenge for many corporations. Internet as a medium of communication is peculiarly distinct from other mediums on many dimensions; for example, command, interactivity, dynamic content, and profundity of content available to the customer [40].

Online ads have a variety of formats, including buttons, banners, interstitials, hot corners, and portals [39]. Nowadays, online advertisement has many more forms as technology and mediums change over time, such as video format ads. Nevertheless, all online advertising formats share typical characteristics that customers have to initiate some action to be disclosed to the transmission. According to Law and Braun-LaTour [58], more positive ad and brand attitudes are associated with a more powerful purchase intention. Therefore, in developing an excellent online ad, it is essential for companies to understand their consumer attitudes towards their promotion, as designers and marketers can better strategise their advertising designs [91].

With more than 58.4% of the globe's inhabitants presently operating social network sites [81], social media has become one the most integral part of online users' day-to-day life. Moreover, social media itself is expressed as all web-based applications constructed on the ideological and technical bases of Web 2.0, which let the result and exchange of User Generated Content' [51]. Being very vastly used, it is now prevalent for marketers all over the globe to use a variety of social media as their advertising channels, such as Facebook and YouTube. However, one

social media has stood up the most compared to the pandemic's beginning, a short-form video social media named TikTok.

TikTok was also the world's most downloaded app in 2020 [21], and there are approximately 92.1 million active TikTok users in Indonesia [21]. With such a substantial number and rapid growth, TikTok has become one of the most popular social media platforms for online advertisements globally, including in Indonesia.

However, unlike other popular video-based social media like YouTube, TikTok has quite a different audience because of its unique platform characteristics, being the platform that provides short video platforms. A recent study indicates that the convenience of content creation, immediate content transmission, and focus on sociality are the distinguishing attributes of a short-video platform [62]. Also, with different features in video length, businesses will have different challenges in advertising their video on TikTok as it is much more compact than YouTube Advertisement. For instance, YouTube ads in terms of length are recommended to be beneath 3 minutes [41]. Whereas TikTok ads, video ads are advised to be as short as 21-34 seconds, with the best-performing one highlighting the critical message within the first 3 seconds of the video [16].

In recent years, TikTok has become a favourite medium for E-Commerce companies to advertise their brand in South-East Asia, as they usually get good results from advertisements through TikTok. As one example, JD.ID, one of the biggest E-Commerce in Indonesia, has increased its app installation number by more than 12 times after their creative advertising on TikTok grabbed the attention of many Indonesian consumers in 2021 [86].

Through many kinds of literature, data, and phenomenon, there is undoubtedly an urgency to explore consumer attitudes toward e-commerce ads on social media, which may help scholars and enterprises benefit from this study's outcomes. Additionally, just like any other technology, social media is rapidly changing over time and has learned to adapt to maintain and satisfy its user. Innovation in social media through software updates is undoubtedly one of the biggest challenges for digital marketers as it also changes the platform's characteristics. Therefore, marketers need to explore the most recent investigation of the problem as it provides more accurate data.

It is worth mentioning that studies exploring Consumer Attitudes toward YouTube Advertisements have already been conducted previously, such as a study by Yang et al. [91] and Burhan [12]. However, unfortunately, no studies are found exploring consumer attitudes towards TikTok Social Media Platform video advertisement, at least not in

Indonesia and not specifically in the E-Commerce Industry. Furthermore, this research is needed to fill the gap in the study. Additionally, this investigation is necessary as the previous research dates three years before this research, in which social media consumer characteristics may differ from recent times. Thus, this study will extend two existing studies with a similar topic by Yang et al. [91] titled "Consumer attitudes toward online video advertisement: YouTube as a platform" and by Burhan [12] titled "Advertisement Characteristics Effect towards Millennial Consumer Behaviour in Response to YouTube Advertisement".

B. Research Questions

1. What variables of E-Commerce Companies' video advertisements affect consumer attitudes on TikTok?
2. What is the relationship between consumer attitudes towards E-Commerce companies' ads on TikTok on consumer intention to watch the ads?
3. What is the relationship between the flow level of using TikTok on consumer intention and behaviour to watch the E-Commerce advertisements displayed?

II. LITERATURE REVIEW

A. Online Advertising and TikTok

Online advertisement is defined as a two-sided market, where an intermediary has a platform that can facilitate relationships between consumers and advertisers [29]. Online activities and programs are specifically designed to engage customers both directly and indirectly, enhance the image, raise awareness or generate sales of products and services [16]. Online advertising can diverge into search, classified, and display advertising [12]. Furthermore, social media occurs to have become one of the newest environments where advertisement takes place [41]. According to Statista [83], in 2021, six of the biggest social media platforms used by marketers worldwide as of January 2021 are; Facebook, Instagram, LinkedIn, YouTube, Twitter and TikTok. However, in Indonesia, TikTok has become the most prominent social media platform for advertisers, especially E-Commerce brands.

According to Statista [83], TikTok has the 6th most active social media user globally with approximately a billion users worldwide, just a couple million users more than Facebook messenger at the 7th place. Since its first creation in 2016, TikTok has developed a complex algorithm that can segment its audiences into categories according to its user's geographic, demographic, and psychographic characteristics. This feature gradually helps marketers put their online video advertisements on

TikTok. In addition, TikTok is famous for being a social media that uses short-form video as its main feature. TikTok videos were once limited to 15 seconds; they later raised their maximum length to one minute and again in July 2021 to three minutes [35]. According to HubSpot's latest survey on 2022 marketing trends, short-form video delivers the most significant return on investment of any social media marketing approach.

As a result, TikTok Advertisement saw a very successful run as it is Ranked #1 globally for ad equity. The platform was reported to have 689 million global active users as of July 2020 [4]. In South-East Asia alone, TikTok's growth by users stood at 52.3% in 2020 compared to the previous year [48]. Because of its popularity, businesses have begun to use TikTok as an advertising platform, including in Indonesia. Lastly, four types of short-length advertisement formats that TikTok provides are TopView, In-Feed Ads, Branded Hashtag Challenge and Branded Effects [86].

B. Attitude towards Internet Advertising

Attitude in marketing terms is described as a general evaluation of a product or service developed over time [82]. Therefore, an advertising attitude is expressed as a consumer's reaction to specific ads, either positive or negative, based on the varied attributes of the ad. Attitude toward advertisements and brand is critical for advertisers as those are the standard measures for assessing advertising effectiveness. In addition, advertising attitudes are considered vital for marketers because a study shows that a more positive advertisement attitude and brand attitude correspond to a stronger intention, particularly in purchasing [58].

Past research by Ducoffe [26] showed that entertainment value, informativeness, and irritation contribute to consumers' evaluations of advertising values and therefore attitudes toward the advertisement. Ducoffe [26] states that certain ads' content (informativeness) and form (entertainment) are critical to the effectiveness of Web advertising in which they affect them positively. While on the other hand, irritation has adverse effects on the viewer's attitudes. Eighmey [28] further validates Ducoffe's model [26] and extends the framework to include credibility, which has also shown a direct association between advertising value and attitudes toward advertisements.

Other research by Yang et al. [91] saw that the four of the previous variables positively influenced attitudes towards advertisements, except irritation, which had a negative effect. Furthermore, Tsang, Ho and Liang [89] also uncovered that entertainment, informativeness, credibility, and irritation directly impact Attitude, with entertainment as the most influential variable. Finally, a more recent study

by Burhan [12] validates the four elements as significantly affected ads attitude. Therefore, these four variables are considered vital in shaping advertisement consumer attitudes, which later determine their behavioural intention according to the Theory of Reasoned Action [95].

Entertainment value lies in its ability to fulfil audiences' needs for escapism, diversion, aesthetic enjoyment or emotional release [65]. Meanwhile, entertainment value in terms leads to the consumer reaction to a pleasurable feeling and joy found in an advertisement that raises a sense of satisfaction [26]. Therefore, entertainment is a vital characteristic of internet marketing where the message that consumers perceive must be concise and funny and instantly captures consumers' attention [53].

On the other hand, informativeness is described as the level of knowledge that advertising provides appropriate information [26].

Unlike the previous two, irritability can divert attention from worthy social goals [31] while exploiting human anxiety and fondly possessing hopes [78]. In the advertising context, irritation is the level of awareness that advertising is considered disturbing or viewed negatively, such as annoying, offensive, or insulting [26]. Thus, many researchers found that perceived irritation negatively impacts the advertisement value perceived by consumers, including Sun et al. [94].

Credibility is as to whether or not the viewer trusts the content of a particular advertisement [9]. It also demonstrates the trustworthiness or usefulness of advertising. In addition, various studies have proven that credibility directly relates to advertising attitude, including a recent study by Burhan [12] that shows credibility positively impacts advertising attitude.

C. Theory of Reasoned Action

The theory of Reasoned action explains the determinants that lead to certain behaviours performed by a person and was developed to understand relationships between attitudes, intentions, and behaviour [7]. According to Webster et al. [95], the Theory of Reasoned Action indicates that behavioural intention determines a person's behaviour. Fishbein & Ajzen [7] divide the beliefs antecedent to behavioural intentions into two theoretically distinct sets: normative and behavioural. While an individual's subjective norm influences normative beliefs, behavioural beliefs are affected by an individual's attitude.

Attitude is expressed as a person's positive or negative feeling about making an action [95]. Attitude also viewed as a construct frequently used to predict individual intention [79], as the TRA emphasizes.

According to a past study, the intention of someone is defined as the amount of action someone is willing to exercise to achieve a goal [6].

Behaviour can be defined as many things, but in simple terms, behaviour is expressed as an individual's overt verbal or physical movement [8]. Meanwhile, according to Doyle [25] in his book "A Dictionary of Marketing", consumer behaviour is described as a process of an identifiable set of consumers making buying decisions.

D. Flow theory

Aside from individual attitudes, a recent study by Yang et al. [91] found that flow level also influences both intention and behaviour of online advertisement consumers. The level flow of a person is considered a significant determinant of intention [46] in the advertising research model. A more recent study by Burhan [12] also discovered that the degree of the flow of someone positively impacts viewer intention in watching advertisements; however, in that research, the flow does not significantly affect viewer behaviour. Additional studies confirm that flow is a decisive predictor of intention, particularly in purchasing in the advertising research model [55].

Csikszentmihalyi [19] defines Flow as a holistic response that people perceive when they act with total involvement. When one is in a flow condition, they will enter a form where they will be intensely absorbed in the activity [91]. People in this state will neglect their surroundings or irrelevant thoughts because they lose self-consciousness. Meanwhile, online Flow can be described by interaction with machines, or digital media devices, enjoyment and reduced self-awareness [20].

E. Theoretical framework

The research in this report will adopt past research models and frameworks by Yang et al. [91] from a *Kybernetes* titled "Consumer attitudes toward online video advertisement: YouTube as a platform".

The framework is based on several studies conducted by past researchers and discussed in the literature review part of this research. The research model adopts the theory of reasoned action, which examines the factors that influence a person's behavioural intention as determined by the person's attitude or the norms that apply to Behaviour [95]. This theory is the basis of erratic Behaviour, intentions, and attitudes. Because this research focuses on advertisements' Behaviour, it is vital to understand the factors affecting a person's attitude regarding ads. Therefore, according to Ducoffe [26], they are entertainment, informativeness, irritation, and credibility [28]. In addition, the flow variable, which

influences a person's intention and a person's behaviour [91], is also used in this research.

III. METHODOLOGY

A. Research Philosophy

In conducting a study, Research philosophy is crucial. It ascribes to how assumptions influence the research strategies and the methods chosen for research [77]. Furthermore, this research will take positivism as its research philosophy as this philosophy considers the presence of objective facts for phenomena that are investigated by calculating the relationship between variables. Moreover, the philosophy concentrates on "causality and law-like generalisations, reducing phenomena to the simplest" [77] and aims to determine causes and effects [93]. Thus, positivism is the most suitable approach for this particular study as it focuses on statistical analysis for determining the cause-effect relationships between constructs in an enormous number of samples [74].

B. Research Design

Research designs have a crucial role in navigating researchers during the research completion process and are also a technique to achieve the research objectives that have been previously determined [76]. Therefore, this research can be categorised as causal explanatory research as the predecessor uses the same design. Furthermore, this type of research intends to identify the influence of a variable on other variables [11]. Moreover, this study will examine eight different variables.

Positivist studies adopt a deductive approach as a general practice [18]. Thus, this research will use a deductive approach to explore a known theory or phenomenon and test if that Theory is accurate under other circumstances. Furthermore, this research will use a mono-method quantitative methodological approach as it is reflected through the data collection, which uses a structured questionnaire and statistical analysis for the analysis method. Additionally, this survey can also be categorised as cross-sectional research as respondents are collected only at a particular time.

C. Research Sample

This research will use probability sampling as its sampling method, where there is selection in terms of criteria while also randomly choosing a sample of people. One type of probability sampling used is simple random sampling, in which everyone has an equal chance of being selected for this research.

In terms of the sample criteria, this study will collect samples of Generation Z aged 18-and 25. The choice of the requirements is since there are approximately 884.9 million TikTok users globally, and 43.7% are between 18-and 24 years old, making them the biggest age group on the platform [24].

Additionally, all the test subjects will have to be located in Indonesia or originated in Indonesia. It is reported that there are 158 million e-commerce users [68] and just above 90 million active TikTok users aged 18 and above [24] in Indonesia. Additionally, the TikTok Ads setting will differ according to its region, and Indonesia is seen as one of the most prominent regions in the platform that shows E-Commerce advertisements.

This research will investigate samples that viewed any E-Commerce Ads on TikTok starting from 2020, as that year, TikTok was the world's most downloaded app 2020 [21] until the first quarter of 2022.

D. Data Collection Method

Two types of data collection are conducted in this research: primary and secondary data. Primary data are collected through a structured questionnaire. The questionnaire will be distributed online through the google forms platform, and only the valid questionnaires will be processed further. The data taken from the subject are only the essential information necessary for the research, such as respondents' demographic data and primary questions related to the study. The main questions will be scaled questions ranging from 1-to 6 to measure all eight variables about to be investigated.

In this research, secondary data will complement the primary data collected and provide information that can't be found through primary data. In addition, secondary data will provide the theoretical foundation and a deeper understanding of the research problems. The secondary data will be sourced from various online and offline writings such as textbooks, articles, and other literature studies.

The data collection of this research follows the Research Ethics Form term and conditions. Accordingly, the questionnaire uses a consent form & information sheet for the survey to collect data. Finally, responses have been collected anonymously with no trace of name or email address in the questionnaire.

E. Data Analysis Method

This research will mainly use two types of analysis: Frequency Distribution and Structural Equation Model (SEM) analysis has advantages in showing the concepts that are not excessive and their associations [37]. This

Method of Analysis was performed by Yang et al. [91] & Burhan [12] to investigate consumer attitudes towards YouTube advertisements. Data analysis is operated by IBM SPSS Statistics 27 software and IBM SPSS AMOS 26 software.

Meanwhile, Frequency Distribution Analysis is defined as a mathematical calculation to measure the number of respondents associated with different values in the variable [63]. This analysis supports a more profound understanding of the survey respondent's profile and characteristics.

On the other hand, Structural Equation Model Analysis is used to simultaneously perform measurement analysis or confirmatory factor analysis (Validity, reliability, goodness-of-fit) and structural model analysis (goodness-of-fit, Causal Relationships). A measurement model measures latent or composite [44], while the structural model tests all hypothetical dependencies based on path analysis [44]. The validity of a research instrument assesses how the device measures what it is designed to measure [54]. Meanwhile, reliability concerns how a measurement of a phenomenon provides stable and consistent results [14]. Testing for reliability is crucial as it refers to the consistency across the parts of a measuring instrument [47].

Furthermore, the Goodness-of-Fit of data is necessary as it helps determine if observed data aligns with what is expected. Some of the fit indices for structural equation modelling that is used in this study are Statistic Chi-Square, Root Mean Square of Approximation (RMSEA) Normed Fit Index (NFI) and Comparative Fit Index (CFI). Finally, the test of the causal relationship is vital as it is used to investigate nomological network relationships between variables in the model where all hypotheses can get their answer.

F. Hypothesis Development

Ducoffe [26] demonstrated that entertainment, informativeness and irritation influenced attitudes toward Web advertisements. In addition, the credibility of an ad also shows that it directly relates to advertising attitudes toward ads [28]. Finally, in recent times, Yang et al. [91] found that the four variables do indeed affect advertising attitudes, particularly on the YouTube platform. Thus, the first hypothesis composed as follows: H1. Perceived entertainment, informativeness, irritation and credibility of the E-Commerce Companies' video advertisements displayed affect consumer attitudes.

In the Theory of Reasoned Action, Fishbein & Ajzen [7] divide the behavioural intention ancestor into theoretically distinct sets: normative and behavioural. While a person's

subjective norm impacts normative beliefs, behavioural beliefs are affected by an individual's attitude. A recent study by Yang et al. [91] and Burhan [12] further links the theory with attitude and intention towards YouTube advertisements. They then found a significant impact on consumer attitude towards online advertisements on the consumer's intention. Consequently, the second hypothesis is cultivated as follows: H2. Consumer attitudes towards E-Commerce Companies' video ads on TikTok affect consumer intention to watch those advertisements.

Liu et al. [61] investigated online e-learning users' acceptance behaviours in three contexts: text-audio, text-audio-video, and audio-video. They found that flow was positively correlated with the intention to use the technology in the text-audio-video and audio-video. In addition, Koufaris [57] confirms that the flow of an online environment is the precursor variable of intention to return to websites. Finally, Yang et al. [91] further validated the influence of a flow on consumer intention and extended it to influence consumer behaviour towards YouTube ads. Therefore, the third hypothesis is cultivated as follows: H3. The flow level of using TikTok affects consumer intention and behaviour to watch the E-Commerce advertisements displayed.

G. Variable Operationalisation

This research is benchmarked through two journal articles entitled "Consumer attitudes toward online video advertisement: YouTube as a platform" by Yang et al. [91] and "Advertisement Characteristics Effect towards Millennial Consumer Behaviour in Response to YouTube Advertisement" by Burhan [12] and adopted nearly all of the indicators contained in the journal in this study. As a result, eight latent variables are observed in this research: entertainment, informativeness, irritation, credibility, attitude, intention, flow, and behaviour.

Measurements for the eight variables in this study used a scale range of 1 - 6, where a scale of 1 represents the state of "Strongly Disagree", 2 as "Disagree", and 3 as "Somewhat Disagree". In contrast, scale 6 represents "Strongly Agree", scale 5 as "Somewhat Agree", and 6 as "Agree". Thus, the operationalisation of the variables in this study is as follows:

III. RESULTS

A. Respondents Profile

Table I below shows the characteristics or profiles of the 220 filtered respondents willing to participate in the questionnaire. Initially, 249 respondents were filling the survey. However, there are 29 unusable responses due to the invalidness of participants' criteria, requiring

them to see E-commerce ads on TikTok at least once. Furthermore, some of the data that this study collects contains the respondent's age, domicile, the reason for using TikTok and the number and duration of accessing TikTok per day.

Table 1 - INTERNAL CONSISTENCY RELIABILITY RESULT

Category	Frequency (n = 220)	(%)
Age		
18-21	191	86.8
22-25	29	13.2
Residence		
Aceh	1	0.5
Bali	1	0.5
Banten	37	16.8
DI Yogyakarta	3	1.4
DKI Jakarta	54	24.5
Jambi	2	0.9
Central Java	3	1.4
East Java	11	5.0
West Java	102	46.4
West Kalimantan	2	0.9
Sumatera (Riau / Riau Islands / North Sumatera / South Sumatera)	4	18
Reason playing TikTok		
Entertainment	86	39.1
Information & Knowledge	7	3.2
Entertainment, Information & Knowledge	108	49.1
Entertainment, Profession	1	0.5
Entertainment, Information & Knowledge, Profession	18	8.2
Online time per day		
Less than 1 hour	69	69
1 < hours < 3	314	314
3 or more hours	109	109

B. Measurement Model Analysis

In this study, Confirmatory Factor Analysis is performed to validate the psychometric properties of the instruments. Data are analysed with IBM SPSS Statistics 27 and IBM SPSS AMOS 26 software thorough examination. The measurement model had an acceptable fit through the chi-square test while also examining its convergent Validity, discriminant validity and Reliability. Goodness-of-fit for the model was confirmed as the model has χ^2/df of 1.475, where according to Ullman [90], the value is less than two. RMSEA of the model is accepted where the value is less than 0.08 [10], with 0.047 being the result. Both CFI and NFI of the model are higher than the desired threshold value, which is acceptable [30] for CFI and for the NFI [13]. Furthermore, every goodness-of-fit statistic is past its cut-off values, and the model satisfactorily fits the data.

According to Fornell and Larcker [1], Convergent Validity was assessed using three criteria:

1. Indicator factor loadings have to be significant at $p < 0.05$ and surpass 0.7
2. Composite Reliabilities must exceed 0.7
3. The average variance extracted or AVE per construct should transcend the variance due to measurement error for that construct.

As shown in Table II, all factor loadings surpassed 0.7 and were significant at $p < 0.001$. All Composite reliabilities are higher than 0.7 except for Behaviour (0.639), and AVE were not all above the cut-off value of 0.50. It is also seen that the Composite Reliability and AVE of our data do not meet the convergent validity value criteria [1]. However, in the same study, they also said that if AVE is less than 0.5 but composite reliability is higher than 0.6, the convergent validity of the construct is still adequate [1]. Therefore, the data shows an appropriate Convergent Validity.

Table 2 - MEASUREMENT MODEL ANALYSIS RESULT

Variable	Indicator	Loadings	Cronbach's a	CR	AVE
Entertainment	ENT1	0.91	0.901	0.926	0.579
	ENT2	0.922			
	ENT3	0.91			
Informativeness	INF1	0.839	0.804	0.883	0.485
	INF2	0.895			
	INF3	0.81			
Irritation	IRR1	0.943	0.874	0.898	0.669
	IRR2	0.943			
Credibility	CRE1	0.887	0.86	0.956	0.682
	CRE2	0.907			
	CRE2	0.859			
Attitude	ATT1	0.893	0.832	0.845	0.363
	ATT2	0.886			
	ATT2	0.817			
Intention	INT1	0.958	0.959	0.955	0.716
	INT2	0.959			
	INT3	0.966			
Behaviour	BE1	0.867	0.663	0.639	0.333
	BE2	0.867			
Flow	FLO1	0.883	0.879	0.965	0.754
	FLO2	0.92			
	FLO3	0.889			

Discriminant validity was evaluated by comparing the use of the square root value of AVE with inter-construct correlation values. In determining a discriminant validity, the square root of AVE must be bigger than the inter-construct correlation [38]. As seen below (Table III), all of the square roots of AVE are higher than its inter-construct correlation, implying a proper discriminant Validity of the data.

Finally, data reliability is examined by using Cronbach's alpha. Churchill and Peter [17] proposed a sufficient level for the alpha coefficient in which a Cronbach's alpha value below 0.60 is undesirable, whereas above that is desirable. Another research stated that Cronbach's alpha coefficient values of more than 0.7 are deemed suitable; however, greater than 0.5 are still acceptable [71]. As seen above (Table II), Cronbach's alpha in all variables showed a value over 0.6, with the smallest being 0.663, indicating the appropriate Reliability of items used for each construct [64].

Table 3 - INTER-CONSTRUCT CORRELATION MATRIX AND SQUARE ROOT AVE

Variable	ENT	INF	IRR	CRE	ATT	INT	BEH	FLO	SQR AVE
ENT	1	0.553	-0.461	0.259	0.659	0.589	0.476	0.278	0.761
INF	0.553	1	-0.275	0.463	0.545	0.497	0.458	0.334	0.697
IRR	-0.461	-0.275	1	-0.061	-0.5	-0.392	-0.498	-0.187	0.818
CRE	0.259	0.463	-0.061	1	0.421	0.341	0.228	0.316	0.826
ATT	0.659	0.545	-0.5	0.421	1	0.613	0.458	0.264	0.602
INT	0.589	0.497	-0.392	0.341	0.613	1	0.504	0.299	0.846
BEH	0.476	0.458	-0.498	0.228	0.458	0.504	1	0.268	0.577
FLO	0.278	0.334	-0.187	0.316	0.264	0.299	0.268	1	0.868

C. Structural Model Analysis

Figure 1 below shows the results of the structural model analysis, including the R and path loadings for all hypothesised relationships. Through the examination from IBM SPSS AMOS 26 software, the $x/df = 1.883$ is accepted with the criterion for acceptance of less than 2 [90]. In the result, RMSEA is 0.064, which, according to Browne & Cudeck [10], the value should be less than 0.08; therefore, RMSEA shows a good fit. Finally, the CFI of the result presents to be 0.94, which is said to be according to Fan et al. [30], where CFI should be above 0.90; thus, CFI is fit. Furthermore, all goodness-of-fit statistics were above their cut-off values, and the model satisfactorily fits the data.

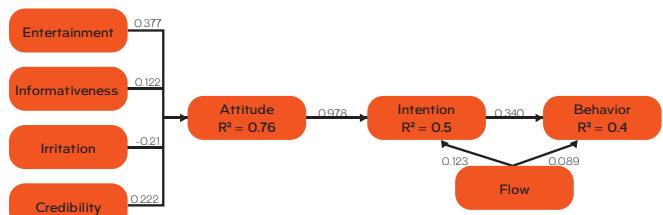


Fig. 1. Structural Model Analysis in Framework

In terms of causal relationships between constructs, analysis shows that all variables influencing attitudes have a significant impact except for perceived informativeness where 0.76 is the R. It shows that Entertainment ($I = 0.377$, $p < 0.001$) and Credibility ($I = 0.222$, $p < 0.001$) influenced positively Attitudes significantly while Irritation ($I = -0.21$, $p < 0.001$) negatively influenced the construct significantly. Meanwhile, Informativeness ($I = 0.122$, $p > 0.05$) shows insufficient effect on Attitude where its p-value is greater than 0.05, meaning that it is not statistically significant. Additionally, Attitudes ($I = 0.978$, $p < 0.001$) showed significant positive influence on Intention ($R = 0.76$, $p < 0.01$) and Intention was also found to have a significant effect on Behaviour ($I = 0.340$, $p < 0.001$) positively. Finally, Flow construct displayed no significant relationship towards intention ($I = 0.123$, $p > 0.05$) and Behaviour ($I = 0.089$, $p > 0.05$) with both of its p-values bigger than 0.005 respectively. A summary of structural model test results is displayed in Table IV.

Table 4 - STRUCTURAL MODEL ANALYSIS RESULT

Path	Estimates	Std. Error	C.R.	P label	Description
Entertainment Attitude	0.377	0.065	5.796	Probability of getting a C.R. in absolute value is less than 0.001	Significant
Informativeness Attitude	0.122	0.074	1.661	The probability of getting a C.R. in absolute value is 0.097	Not Significant
Irritation Attitude	-0.210	0.044	-4.792	Probability of getting a C.R. in absolute value is less than 0.001	Significant
Credibility Attitude	0.222	0.056	3.994	Probability of getting a C.R. in absolute value is less than 0.001	Significant
Attitude Intention	0.978	0.092	10.625	Probability of getting a C.R. in absolute value is less than 0.001	Significant
Intention Behaviour	0.340	0.046	7.443	Probability of getting a C.R. in absolute value is less than 0.001	Significant
Flow Intention	0.123	0.065	1.889	Probability of getting a C.R. in absolute value is 0.059	Not Significant
Flow Behaviour	0.089	0.050	1.786	Probability of getting a C.R. in absolute value is 0.074	Not Significant

IV. DISCUSSION

A. Discussion of Result

As is seen in the previous part, the results reveal that the model's suitability in the circumstances of online ads in video form is backed by the extent to which the results pursue those of prior studies, particularly in social media advertisements such as YouTube ads [12]. Originally, Ducoffe [26] and later Eighmey [28] indicate that entertainment value, informativeness, irritability, and credibility perceived from ads significantly affect advertising value. However, Three out of four of the first hypothesis's constituent variables, which are entertainment, irritability, and credibility of advertisements, are supported, with informativeness not being supported. Additionally, the entertainment and credibility variable positively show a notable explanatory effect on attitude. At the same time, irritation is demonstrated to influence attitudes negatively. The research discoveries are still inconsistent with earlier recent research by Yang et al. [91] and Burhan [12]. However, these findings are more likely to happen due to the different social media platforms used for the study.

With a notable influence on perceived entertainment value, E-Commerce companies' ads on TikTok may be considered a likeable experience for audiences as they can satisfy viewers' needs for diversion, aesthetic delight or emotional liberation [65]. Moreover, the E-Commerce ads deliver credibility to viewers because they may rely upon the content of these ads [9]. Nevertheless, viewers may regard companies' ads as bothersome, offensive or annoying [26] with their high degree of perceived irritability. E-Commerce ads may also offer a high degree of relevant information [26], despite the outcome

indicating no significant relationship between perceived informativeness and viewer ads attitude.

On the other hand, the research's second hypothesis, backed by recent research on consumer attitudes towards online ads on YouTube by Yang et al. [91] and Burhan [12], is accepted according to the study's findings. This research demonstrates that ad attitudes toward E-Commerce companies' ads on TikTok significantly impact intention to watch the related ads. Customers with positive attitudes toward E-Commerce ads will increase their intention to watch the ads. Thus, the two also affect differently, meaning customers with negative attitudes will also decrease their intention to view the advertisement. The viewers may think that the advertising is trustworthy and pleasant. These attitudes may positively enhance viewers' intention to see the TikTok ads of E-Commerce firms.

Finally, the study rejects the third and last hypothesis. In the findings, flow shows no significant influence on a person's intention and behaviour towards E-Commerce companies' ads on TikTok despite being an essential factor in intention and behaviour towards video ads on YouTube [91]. Individuals that watch TikTok video ads may be immersed in the knowledge they are interested in [91], with descriptive results showing flow variables being the biggest score (4.1 from 6) compared to other variables. However, in TikTok specifically, there is not sufficient impact on the consumer intention and behaviour toward the E-Commerce advertisement, as confirmed by this research's findings.

Table 4 - STRUCTURAL MODEL ANALYSIS RESULT

Hypothesis	Path	Results
H1	Entertainment Attitude	Supported
	Informativeness Attitude	Not Supported
	Irritation Attitude	Supported
	Credibility Attitude	Supported
H2	Attitude Intention	Supported
H3	Flow Intention	Not Supported
	Flow Behaviour	Not Supported

B. Limitation

The limitations of this study are as follows.

1. There is no sufficient study that supports the flow level using the platform on intention and behaviour.
2. The obtained sample is dominated by Indonesian living on Java Island with an age range of 18-21; therefore, this research may yield biased results.
3. As this study explores specifically TikTok as the medium, the result may preclude the possibility of describing perceptions with other online platforms.
4. In this study, data is gathered through online surveys, which may result in sampling bias.

V. CONCLUSION

A. Study Conclusion

This study exhibited an online advertising model in video and operated TikTok to examine multiple advertisements elements. The study model is benchmarked on two recent studies from Yang et al. [91] and Burhan [12] for their investigation of operating YouTube as the platform. In addition, this research explored the aspects influencing attitudes toward online ads. The findings imply that entertainment, irritation, and credibility influence attitudes toward E-Commerce companies' ads. In contrast, informativeness does not significantly affect attitude toward those advertisements, which may occur due to consumer from different nation may have different concern on influences including informativeness [96].

It is also examined that Attitude toward E-Commerce company ads significantly influences viewers' intention to watch the ads with a positive relationship. On the other hand, this study uncovers that the TikTok platform's flow level does not significantly influence viewers' intention and behaviour in watching the E-Commerce ads. TikTok viewer have a very different flow experience compared to YouTube's due to the fact that flow may occur at various levels [20] according to each environment. Therefore, E-Commerce firms may use this study's conclusions to better strategize their TikTok video advertisement.

B. Managerial implications

Ideally, online video advertising has four unique objectives under the RACE framework. Therefore, marketers may use different strategies and tactics in displaying their online ads. Utilising this study model, marketing or advertising managers can mature their business strategies to be effective and precise, particularly for E-Commerce companies wishing to use TikTok Ads in Indonesia.

E-Commerce firm marketers may have to review their advertising content and consider actions to improve its credibility and entertainment value, as this study shows a significant impact on consumers' advertising attitude. Alternatively, marketers should also lower the degree of irritability of their ads to their audiences due to the outcome of this study showing irritation with ads has a negative impact on advertising attitudes. Furthermore, according to this study, when viewers carry positive attitudes toward the ads, they may have a greater intention to view that advertisement itself, implying how essential advertising attitudes are for the marketer to consider.

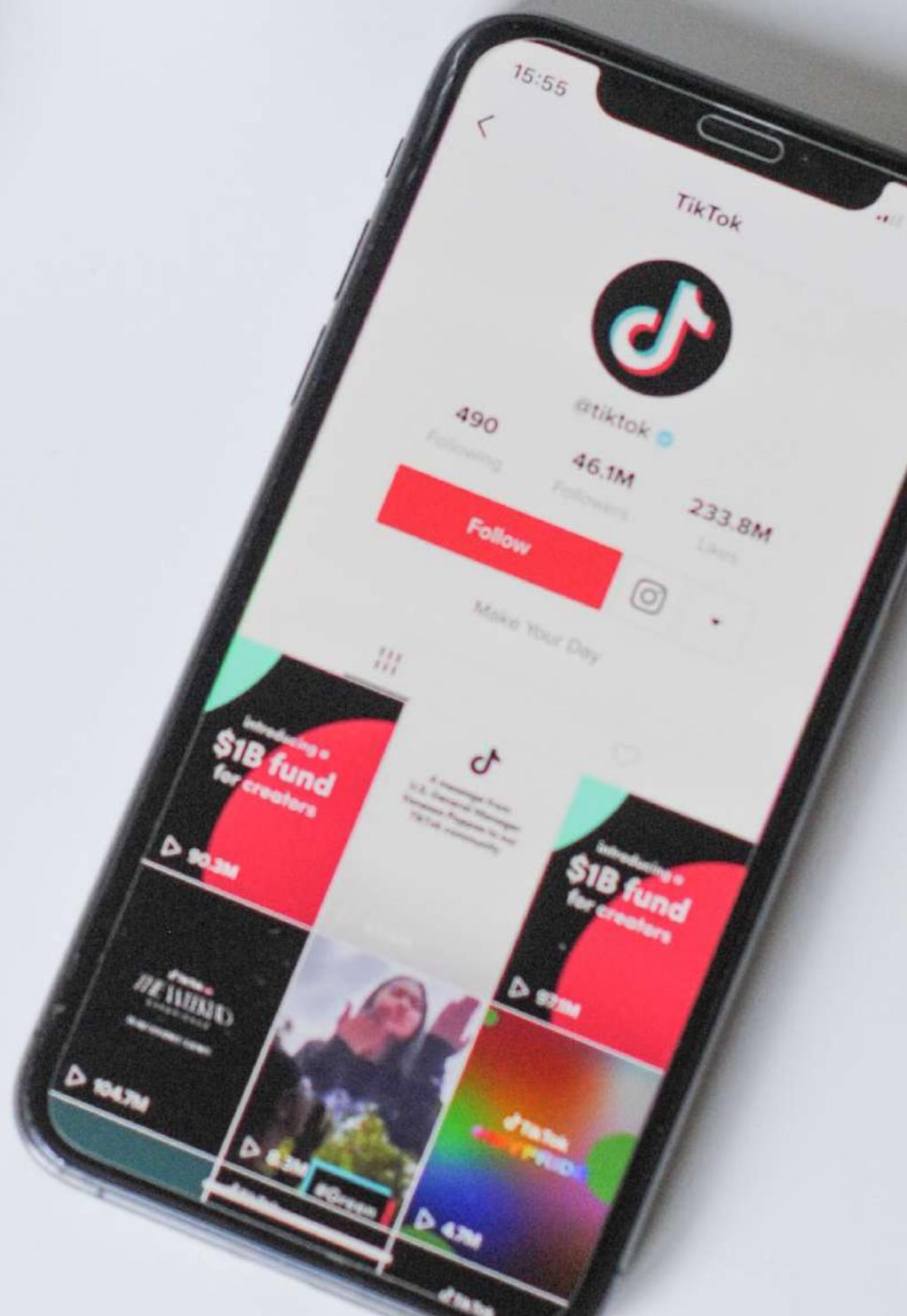
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Paper 22

Recovery & growth strategies for a MICE company amidst the COVID-19 crisis and post-pandemic implications

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ICMEM

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Abstract - In 2020, the World Health Organization declared the COVID-19 outbreak a pandemic. Indonesia declared the situation as a national disaster. Over the past years variants emerged. During these years, companies faced business disruption, and some had to close as measures involving distancing, travel, gatherings, and lockdowns were enforced. These measures also endangered the meetings, incentives, conferences and exhibitions (MICE) sector.

This paper presents a study of the business issues faced by a Professional Conference Organizer (PCO), which like other MICE companies, faced difficulties amidst the pandemic which at the time of this writing has not yet ended. For these issues this study developed business strategies towards recovery, adaptation and growth in the current and post-pandemic era.

The studied companies faced revenue decrease, competition and uncertainty. To survive, these companies had to raise capital, reduce manpower and salaries. In addition, the shifting to virtual formats poses a threat. Hence, strategies concerning pricing, segmentation focus and resilience are evaluated against the current and expected conditions. Some key recommendations of this study include expanding focus to a broader segment, R&D and diversification.

Keywords-business disruption, COVID-19, diversification, events, Indonesia, MICE, pandemic, PCO, resilience

I. INTRODUCTION

MICE stands for Meetings, Incentives, Conferences & Exhibition. Fenich [1] uses the acronym MEEC: Meetings, Expositions, Events, and Conventions. However, MICE is still used in various parts of the world and described the broad elements of MEEC which include Conventions and Meetings, Expositions, Festivals, Mega-Events, Corporate, Social, Religious, Special, Retail and Sports Events. In 2017 the MICE industry contributed US\$7.8 billion to the GDP and created 278,000 jobs in Indonesia [2].

Currently, MICE companies are facing a big challenge as the whole world was shook by the unprecedented spread of a contagious disease. Governments imposed measures such as the ban of public gatherings, lockdowns and travel bans. Consequently, MICE companies postponed and cancelled various events. Two years into the pandemic, there remains uncertainty as new variants spread rapidly

and to prevent further spread restrictions are extended [3]. It remains uncertain when the pandemic will be exactly over.

MICE companies are forced to adjust recovery strategies. In addition, changing market needs and opportunities could have developed because of the increasing popularity of virtual meetings. Therefore, looking into the value proposition, overhead cost, capital investments, new products and services are important. The world was not prepared for the multitude of this scale and can be considered very rare. However, the EU Research & Innovation Magazine "Horizon" highlighted that future pandemics are inevitable and lessons can be learned from this situation towards reducing the impact of future pandemics [4]. MICE companies should consider a next crisis and investigate lessons learned. Without preparation, business resilience will be at stake. The implementation of sound business diversification strategies can be a powerful antidote to disruption risk.

A. Paper Objectives

This paper reviews how the COVID-19 pandemic has affected MICE companies in Indonesia and aims to identify post-pandemic trends related to the MICE industry. For the case company Royalindo, the study also develops business strategies catered to overcoming the current situation and the post-pandemic outlook. In doing this, the study attempts to answer research questions on what the current challenges of the MICE industry in Indonesia are, what the survival strategies of MICE companies are, and what strategies can be adjusted and improved. Secondly, on how one can prepare itself to face the competitive environment as the MICE industry recovers gradually. It will consider relevant pricing strategies and cost management strategies.

Furthermore, on how the pandemic influenced and changed the market behavior, needs and demands of the customers. It will consider what new post-pandemic demands can be identified and what kind of strategies should be formulated by the company, to address these post-pandemic trends.

Finally, on what the lessons learned are from this pandemic, how one can best prepare itself for the next crisis. And, what diversification strategies the company can prepare, to remain competitive, resilient and successful.

II. LITERATURE REVIEW

Multiple theories and concepts come together to facilitate the research. A conceptual framework based on these strategic concepts and strategic-analysis-models is created. By utilizing this conceptual framework as a tool, a visualization will help towards a clear understanding of the relationships among the concepts. The framework, illustrated in Figure 1, consist of three phases.

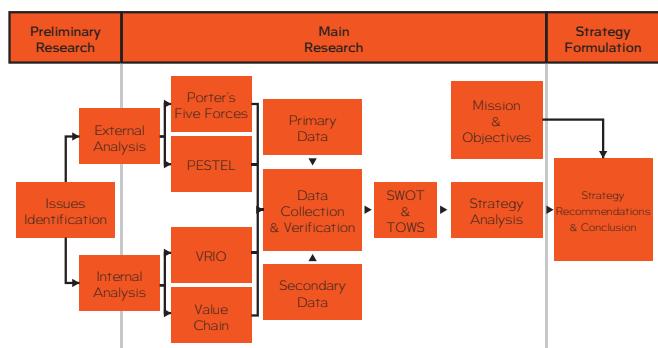


Fig. 1. Conceptual Framework

The first phase, called the preliminary research, is the initial exploration of the business issues and the analysis that can be pre-identified by studying various macroeconomic reports.

The second phase, called the main research, is the broader analysis of business situation. External analysis is conducted utilizing Porter's Five Forces Model: a tool to analyze the industry where the company operates towards understanding the competition within the industry, and PESTEL analysis: a tool that can be utilized to analyze the macro-environmental factors that influences a company. Internal analysis is conducted utilizing the VRIO Framework: a decision tree to analyze whether the resource, capability or competency meets the VRIO requirements, and Porter's Value Chain Model: visualizes how the company's primary and support activities can create value and a profit margin. This phase also includes primary and secondary data collection and verification.

The third phase, called strategy formulation & implementation, is the last part where the formulation of the recommended strategies and implementation plans is performed.

This paper applies two strategic management theories. First, the concept of Porter's Generic Strategies considering that the case company must handle and overcome competition. The theory depicts that the company must choose one of the quadrants and avoid being stuck in the middle. This is how a company will be able to attain a competitive advantage [5]. Choosing one of the quadrants with regards of positioning can be a good

starting point in setting a direction towards formulating a thorough strategy.

In terms of performing a more holistic approach towards formulating a thorough strategy, this paper considers the strategy diamond of Hambrick & Fredrickson. Based on input from the company's missions and objectives and strategic analyses, five elements (arenas, differentiators, economic logic, vehicles and staging) of the strategy diamond can be composed. This can be followed by formulating the supporting organizational arrangements [6].

III. RESEARCH METHODOLOGY

The research conducted in this paper utilizes a mixed method of internal and external analysis earlier explained in Chapter 2. This is followed by a mixed method of a quantitative and qualitative research. The quantitative data is generated through two sets of questionnaires, allowing a multi-perspective analysis.

The first questionnaire, aimed at users of MICE services, has been filled in by 169 people who represent various small, medium and large sized companies in Indonesia. However, 102 qualify as a valid MICE user and completed the questionnaire, and therefore these only 102 were analyzed.

The second questionnaire, aimed at MICE companies such as Conference Organizers, Exhibition Organizers and other Event Organizers, has been filled in by 59 people of which 47 qualify as a MICE company. Hence, only 47 responses were analyzed in this study.

The qualitative data is generated through interviews with multi-stakeholder industry experts: (1) the President-Director at Royalindo; (2) a Senior Project Manager at Royalindo; (3)a PR Manager at Pacto Convex, a competitor company; (4) a Director at Dyandra Promosindo, a competitor company; (5) a Chief Marketing Officer at JIEXPO or Jakarta International Expo, a venue; (6) a Director of Convention Services at JCC or Balai Sidang Jakarta Convention Center, a venue; and (7) the Chairman of Asosiasi Perusahaan Pameran Indonesia (ASPERAPI) or in English the Indonesian Exhibition Companies Association (IECA) the biggest MICE industry association in Indonesia. Stakeholder number 6 and 7 is the same person serving two roles.

In addition, reports and articles from journals, such as the Journal of the Community Development Society and the Journal of Environmental Management and Tourism, concerning the MICE sector amidst the pandemic worldwide, in Malaysia and Indonesia were reviewed, analyzed and compared with the findings and outcomes

of the primary data collection. Based on all the analyses and research a SWOT & TOWS was conducted. Finally, the research questions could be answered and utilizing the Strategy Diamond relevant recommendations could be formulated.

IV. RESULTS

In Chapter 1, multiple business issues have been introduced. However, aside business disruption that led to decrease of revenues, the changing market and the probability of future pandemics which both leads to implications for the relevance of MICE activities and resilience, another implication has been identified, namely increased competition. According to the ASEAN+3 Macroeconomic Research Office (AMRO) the ongoing recovery from the disruption is a divergent recovery as some of the sectors, such as the MICE industry, are not able recover at the same rate as other industries as the nature of MICE is physical face-to-face gatherings. This type of business is still restricted by the government [7]. This slow recovery may cause a low demand for projects combined with a high supply of service providers which may lead to increased competition. Meaning, MICE companies must improve their competitive strategies.

Hence, there are four issues identified connected to four research questions that are described in Chapter I.A.

A. Quantitative Results Questionnaire 1

A brief selection of the 15 question results will be highlighted. From the 102 respondents 53.92% indicated that the need for MICE services decreased during the pandemic as most online or hybrid events could be organized without a MICE organizer.

For the post-pandemic era, most respondents agree that the need for MICE services will focus more on online and hybrid even though the pandemic will end, 62.75% "Agreed" and 14.71% "Strongly Agreed". However, a large majority, as in Figure 2, also agrees that events will shift back to physical as networking still requires activities that facilitate social interactions, 62.38% "Agreed" and 24.75% "Strongly Agreed".

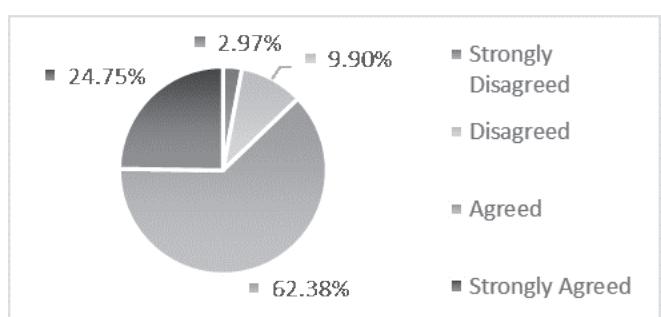


Fig. 2. Questionnaire No.1: The need for MICE services will return to focus on offline

On the question on how a MICE PCO or Event Organizer (EO) company could help the respondent's company in other aspects of the business that are not related to events, most of the respondents indicated that MICE PCO/EO companies could help with Marketing and Advertising, Professional Training & Coaching, Public Relations and Communications, Media Production and Facilities Services, 32.35% to 43.14% have selected these answers.

B. Quantitative Results Questionnaire 2

A brief selection the 20 questions results will be highlighted. From the 47 respondents, 87.76% indicated that their company experienced decline in revenue due to restrictions and economic disruption. Their companies had to reduce working hours and employee salaries, allowances and/or bonuses, Reduced employee salaries, allowances and/or bonuses while continue working the same hours. 31.91% to 36.17% selected these answers. To survive, 70.21% of the companies adapted to online/hybrid services, 51.06% looked for other income with business activities outside the MICE industry and 44.68% reduced business expenses.

Aside declining revenues, respondents also experienced other challenges as 57.45% faced "Tough competition in winning the tender", 55.32% faced difficulties concerning "Obtaining event permits", 53.19% are challenged with "Certainty about the execution of the event" and 19.15% indicated that obtaining capital for pre-financing events and recruiting skilled workforce as a challenge.

In terms of competition, 69.57% agreed and 13.04% strongly agreed that competition among MICE industry players in the last year of the pandemic and in 2023 will be very competitive due to oversupply (combination of low demand for organizing events & a lot of MICE businesses). However, the companies are positive on the outlook in terms of future revenues: 57.14% agreed and 26.53% strongly agreed that the expected revenue in 2023 will be more than revenue in 2019.

In addition, 59.18% agreed and 32.65% strongly agreed that the need for MICE services will focus on in-person events again because building a business network (networking) requires personal and social interaction. In terms of diversification, 61.22% agreed and 20.41% strongly agreed that their company should expand beyond MICE to have better survivability in the next crisis.

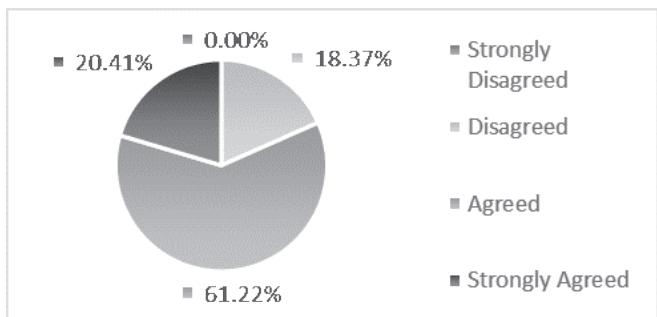


Fig. 3. Questionnaire No.2: The need for MICE services will return to focus on offline

C. Qualitative Results Interviews

All the interview results have been coded and sorted. The below Table 1 is an overview of the amount of phrases that were associated with a certain code to the concerning stakeholder.

The code, "behavior" concerns the changing behavior the shift from attending in-person events towards attending virtual events. Most of the respondents believe that in-person events will still be relevant despite that the business

Table 1 - INTERVIEW RESULTS CODES TABULATION

Stakeholder/Code	1	2	3	4	5	6
Behavior	3	1	2	2	2	5
Cashflow	6	2	2	9	11	2
Competencies	5	7	7	3	0	0
Competition	12	5	1	5	0	10
Diversification	2	1	2	3	2	3
Government	4	4	4	2	0	3
Impact of Pandemic	6	4	4	3	9	8
Post-pandemic	9	5	3	4	6	6
Resilience	2	1	0	1	1	7
Strategic Partnership	1	1	0	0	2	2

world has adapted to online conferencing. One key argument is that some of the important aspects that happen during an in-person event, such as: meeting decision makers, setting up business deals and networking, is difficult to happen through an online platform.

The second code, "cashflow" entails the management cashflow. Respondents minimized outflows and decreased operation expenses including salaries. Companies were able to decrease utilities expenses as employees worked from home. The adaptation of business activities to online events and other income streams supported revenues. In

addition, retained earnings, financing from shareholders and banks, and retaining upfront payments from clients supported cashflow.

The third code, "competencies" concerns the specific competencies of these companies. The respondents have extensive track-records being in the business for years. They will do their best efforts to retain status quo in delivering the same quality despite losses. Organizers have adapted competencies for organizing online and hybrid events. The open discussion within the industry associations enabled knowledge sharing that fueled better decision-making for company leaders.

The fourth code, "competition" covers the current and expected competition. One of the respondents benefited from the decreased tender participants in early 2020 resulting in higher chance to win. However, competition is considered as fierce now because of a decrease in demand which caused companies to expand focus. Companies normally focused on exhibition expanded to segments such as conferences, and vice-versa. Furthermore, retaining clients by offering better quality for the same price is one of the strategies that companies conducted to stay ahead.

The fifth code, "diversification" entails how companies have diversified or planning to diversify within and beyond the industry. Many industry players have expanded and diversified service and market segments. Some have diversified within the industry by vertical integration to support the main business, and others are part of an unrelated diversified group who can support each other.

The sixth code, "government" concerns government support amidst the pandemic. Respondents conducted dialogues with the government through the industry associations on how the government could help. Key points were the issuance of permits and opening borders for travelers. Aside, government aid, requests were made to the government to continue open tenders for events.

The seventh code, "impact of pandemic" encompasses how the pandemic has affected business operations. All the respondents experienced a decline in revenues due to disruption. Moreover, profits from organizing online events is low compared to profits from in-person events.

The eighth code "post-pandemic" entails how the companies anticipate the future. For this study, the post-pandemic era is defined as time expected in year 2023 and 2024 where restrictions are lifted. Respondents anticipate rebound and growth. The economic growth and investments in infrastructure such as the development racing circuits and stadiums support the industry overall. The initial focus will be on domestic market rather than

the international market. In terms of conferences the in-person attendance is not expected to be the same as pre-pandemic, for this segment the online attendance is expected to grow.

The ninth code, "resilience" concerns resilience against disruptions. There are various perspectives on resilience plans. A contingency plan is one of the main ideas. Diversification by doing a different business is also a suggestion. Liquid assets such as cash reserves in foreign currencies instead of non-liquid assets is another idea that can support resilience amidst business disruption.

The tenth code, "strategic partnership" entails how respondents conducted special collaboration with their suppliers and clients towards surviving the pandemic. Most of the respondents indicate that keeping good client-supplier and supplier-client relationship is important in these critical times. Together, solutions can be explored that will result in mutual benefits.

D. Other secondary data analysis

Worldwide the MICE Industry got affected by the COVID-19 pandemic. Min Ho and Kee Ming Sia's [8] paper entails the pandemic and MICE in Malaysia. One of the future trends for MICE identified in Min Ho and Kee Ming Sia's article was that even though there would be an increased demand for virtual event platforms, engagement (similar or equivalent to in-person) through such platform is very challenging. Another future trend is the limited international events because of international travel complications. Hence, focus is on the domestic market.

These two identified trends in Min Ho and Kee Ming Sia' paper are in line with the findings of the interviews conducted in the study of this paper with Indonesian MICE companies. These Indonesian MICE companies indicated, as described in Chapter IV section C, that engagement is difficult through an online platform and that in the post-pandemic era the focus will be on developing domestic events rather than internationally because of travel restrictions.

Min Ho and Kee Ming Sia' paper also includes direction for future research. One of these directions "Will Malaysia revert to strong presence of physical business events after the pandemic or will they be replaced by virtual or hybrid business events in the future?"

That question could also be relevant for Indonesia as user behavior is one of the topics covered in this paper. Hence the question could be reformulated for Indonesia: "Will Indonesia revert to strong presence of physical business events after the pandemic or will they be replaced by virtual or hybrid business events in the future?" Based on

the interviews and questionnaire conducted in this study with Indonesian MICE companies and Indonesian MICE users, the majority agrees that MICE in Indonesia will revert back to physical business events because networking still requires activities that facilitate social interactions that cannot be done virtually.

The Indonesian Tourism report of Q1 year 2022 published by Fitch Solutions Group Limited describes that the government is developing multiple tourist destinations.

The report forecasts that the overall tourism arrivals will rebound by year 2024. In terms of infrastructure development, the report specifically mentions an example of the benefits of the MICE industry: "The Mandalika area, located near Lombok International Airport, is also currently being developed to attract a wide range of tourism, from ecotourism to MICE (meetings, incentives, conferencing, exhibitions) events." [9]

The above-mentioned report supports the idea that the Indonesian government has long-term strategic plants to grow MICE Industry through infrastructure development. The Indonesian government is also focusing on human capital development as Asia News Monitor mentions that the Indonesian government is planning to hone the skills of tourism professionals: "Such activities comprise skill development in Meetings, Incentives, Conferencing, Exhibitions (MICE) and holding activities in the ASEAN region in accordance with the competency standard." [10]

Based on these reports it can be well argued that the MICE Industry is expected to receive support from the government towards further growth in the MICE Industry.

For a 2021 paper of Ukhina published in the Journal of Environmental Management and Tourism a survey involving 35 experts was conducted. These respondents were managers of travel companies specializing in business tourism, with at least seven years of work experience, who were asked some questions related to the development of business tourism after the restrictions were lifted.

The paper indicates that it is unlikely that virtual formats will replace face-to-face meetings despite the increasing popularity of the virtual formats: "... it is unlikely that a virtual format will replace face-to-face meetings, as vendors and planners tend to favor offline or hybrid events over fully virtual ones." [12] .

Furthermore, the paper also concluded that recovery will be different in certain MICE segments, some such as exhibitions and business meetings will be faster than others such as conferences and incentive tourism. The below figure is an excerpt of the table in the paper.

Table 2 - PROSPECTS AND TIMEFRAMES OF RECOVERY FOR THE SEGMENTS OF THE MICE INDUSTRY

Segment	Expert Opinion
Business Meetings	Fast Recovery; limited growth due to mainly essential travel
Incentive Tourism	Recovery & Growth in the medium & long term, i.e. when considered safe to travel
Conferences	The future belongs to digital platforms
Exhibitions	Fast Recovery

Source: Adapted from the Journal of Environmental Management and Tourism

qualitative research results of the study with the Indonesian MICE companies. In the interview with multi-stakeholders, these Indonesian MICE experts indicated that events will revert to the in-person format as earlier described. They also expect overall growth in the MICE Industry. However, the in-person attendance of conferences might not revert to the same as pre-pandemic, instead online attendance will most likely grow.

V. DISCUSSIONS

One of the interesting findings of the quantitative research results is that over 76% of the respondents (strongly) agreed that need for MICE services will focus more on online and hybrid meetings while over 86% (strongly) agreed that MICE services will focus on offline gatherings/meetings because in building a business network (networking) there is still a need for activities that facilitate personal and social interactions. These results provide beneficial insights towards answering the questions of the user behavior in the post-pandemic era, whether the focus will revert to in-person or stay online. In this case, both findings indicate a focus on online events while also reverting focus to in-person events. Therefore, these results might also suggest that the hybrid system or the online aspect will always be there for the future either as a solely online event or part of an in-person event. It could be beneficial to further study the outlook of the specific type of events (exhibition or conference etc.) that is expected to be held solely online, solely in-person, or a combination of both (hybrid). For this hybrid it must be clearly defined of what kind of set-up is considered hybrid.

From the perspective of the MICE companies, which has been studied through the second questionnaire, over 90%

of the respondents (strongly) agreed that the need for MICE services will focus on in-person events. Over 75% (strongly) disagreed that MICE services will focus more on 100% online rather than hybrid or offline.

The findings in both questionnaires show the same results in terms of MICE reverting to in-person again in the post-pandemic era. The qualitative research results connected with the code "behavior" suggests that in-person events are beneficial because of the social aspects and engagement that cannot be facilitated through online platforms. The earlier research conducted in Min Ho and Kee Ming Sia's paper also mentioned that engagement is difficult.

It can therefore be well argued that MICE companies are still relevant for the future and therefore there will still be a need for MICE services. However, it is not the same for all MICE segments as it is expected that the numbers of in-person conference attendants in the future will most likely not return to the same numbers as prior the pandemic. The expected growth in online conference attendants may present other opportunities.

Most MICE companies experienced revenue decrease. Other challenges are, obtaining event permits, certainty of event execution, obtaining capital and recruiting skilled work force. The companies survived by reducing manpower and utilities costs. Revenues were obtained by the continuation of MICE services by adapting to virtual formats and other side business. Cashflow was managed by retaining previous earnings, bank loans, reserving upfront payments from clients for future event execution and capital injections from shareholders. These methods have proven to be successful for the studied companies to survive so far. Now that the government is loosening measures, the MICE industry enters in the era of recovery. However, the research indicates that MICE companies experience fierce competition. In the questionnaire aimed at MICE companies over 72% (strongly) agreed that competition among MICE industry players in the last year of the pandemic and in 2023 will be very competitive due to oversupply (combination of low demand for organizing events & a lot of MICE businesses).

The qualitative results related with the code "competition" has similar findings with the quantitative results. The competition is considered as fierce because of a decrease in demand which caused companies to expand focus. Companies normally focused on exhibition expanded to segments such as conferences, and vice-versa. This results in an extra competitive environment. This qualitative research findings gives further insights in line with the quantitative research findings. Both results support that competition is an issue that MICE companies are currently facing. To overcome the current and future

competition relevant strategies such as segmentation focus, pricing and cost strategies could be developed and implemented.

Diversification is one of the key aspects in this study. In the questionnaire aimed at MICE companies over 81% (strongly) agreed that their company should expand beyond MICE to have better survivability in the next crisis. In the questionnaire aimed at MICE users, respondents were asked the question in what non-MICE related fields MICE companies could help. Marketing and Advertising, Professional Training & Coaching, Public Relations and Communications, Media Production and Facilities Services were amongst the top answers. These business activities may be taken into consideration for diversification plans.

VI. CONCLUSION

This chapter presents recommendations, utilizing Porter's Generic Strategies and the Strategy Diamond, for the case company. The current competitive scope of the case company can be considered as narrow as the company operates in a niche market, mainly organizing events for the government. In utilizing the matrix in Figure 4, the company is currently positioned at "Focused Differentiation", visualized with a circle. The recommendation is to shift focus by expanding the client segment that can be achieved by adding a consumer exhibition as business activity. With this, the scope shifts from a narrow to a broad one, visualized with a star. Hence, the new generic strategy is "Differentiation".

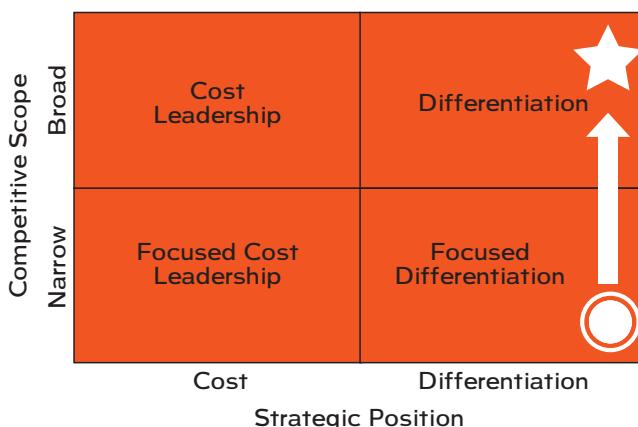


Fig. 4. Porter's Generic Strategies

To continue a more holistic strategic formulation, the elements of the Strategy Diamond: arenas, differentiators, economic logic, vehicles and staging will be utilized. In terms of arenas, the geographic areas, the case company's office is in Jakarta where the central government and most corporate offices are located. In 2024, the government is planning to move to a new capital Nusantara. Therefore, the company should open a branch in Nusantara so it can continue to provide services to the government.

In terms of price, for government tenders the company should do lower pricing than its competition without giving up quality and profits. For corporate tenders, the lowest price is not necessary thus an equal to higher competitive pricing is advised and can be justified with the well-established brand reputation, and features or benefits of the services provided being more premium. For the new product/service segment consumer exhibition, a penetration pricing strategy can help to grow market share. The pricing strategy can be adjusted once market share has reached a certain target.

In terms of differentiation, the company should aim to retain the existing image of a high quality, professional, and creative. This can be achieved by having a good team and good vendors/suppliers, and quality control procedures making sure all details are accordingly addressed and client requests can be accommodated. Creating presentation materials, showcasing past events utilizing video and photos, and utilizing VR technologies can catalyze the already existing 30+ years track record and bring forward the creativity of the team.

In terms of economic logic, the company earns a profit by utilizing a relevant pricing strategy or each type of service and market segment with efficient and low cost of production by forming strategic alliances such as vertical integration with suppliers and vendors. In terms of vehicles, in general the company should nurture the existing relations with industry players by utilizing alliances through industry associations. For the conference segment, the company should initiate R&D on the monetization of online conference attendants through open innovation / collaboration. For the exhibition segment, the company could (partially) acquire or do a joint venture with companies that have market share or expertise.

In terms of staging, three phases can be identified. In Phase I 2022, the company could implement the pricing strategies do recruitment for additional bidding staff, maintain, and expand alliances with industry players, explore candidate companies for joint venture, or M&A for the exhibition segment. In phase II 2023, the exploration of office space in Nusantara, recruit & train staff, re-structure towards multi-branch organization, execute joint venture, or M&A for the exhibition segment, initiate joint R&D with open innovation. In Phase II 2023, open branch office in office in Nusantara, conduct R&D on premium services revenue stream from conference attendants.

The pandemic has shown that it is dangerous to stay in a single industry. To stay agile the company should move in new markets and industries by starting with related diversification, a new business activity and industry that has commonalities with components of the company's value chain.

Based on the research, the activity of conducting Professional Training & Coaching at hotels and other multi-functional rooms has a commonality with the MICE. In terms of Media Production, the commonality is the hybrid conferencing using broadcast and video that is nowadays used and expected to be further utilized in MICE. Restructure towards a corporate organization is recommended with the corporate entity at the top and divisions and business units below as illustrated in Figure 5. The corporate parent should add value to the companies through parenting propositions such as the 'link proposition' where business units can work together. The corporate entity should encourage synergies in terms of intra-group supply and resource utilization that lead to parenting advantage. For example, the MICE business could handle the gathering and accommodations arrangements for the execution of training programs of the Education business. Another example could be where the Media business provides the necessary broadcast and video production of a conference that is handled by the MICE business.

Ultimately, superior performance is achieved when parenting advantage and competitive advantage is achieved at the same time by having the right business strategies at the business levels and corporate strategy at the corporate level.

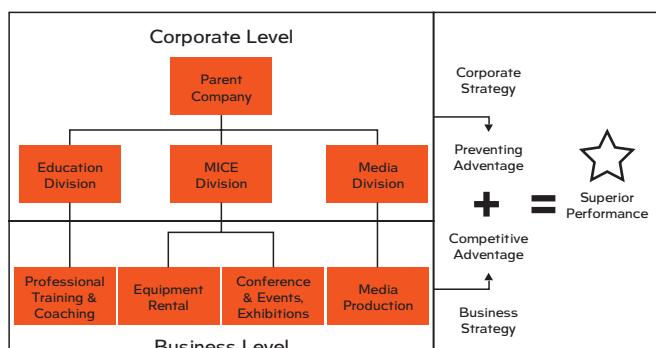


Fig. 5. Proposed Corporate Structure

A. Managerial Implications

The above proposed practical strategies and actions may naturally have managerial implication. Some key managerial implications are described in this section.

The broadening of the scope by expanding the client segment by adding a consumer exhibition as business activity may come with implications. Further market research is advised to identify existing consumer exhibition and areas of opportunities within the consumer exhibition segment. Hiring the necessary manpower whose competencies lies stronger in the consumer exhibition segment is also recommended. In addition, to mitigate risk a strategic alliance through joint or M&A can be done with a consumer exhibition organizer.

Engaging in a strategic alliance itself has its implications. The strategic alliance could succeed but also fail. To decrease the chance of failure, potential partners must be thoroughly reviewed and tested for compatibility in terms of vision, mission, structure, financial health but also culture. It is therefore advised to hire an expert who can provide good advice and insights guiding the strategic alliance towards mitigating failures and providing early warning signals and stop the formation of a strategic alliance relative in time preventing further damage.

Adding a branch office in Nusantara may also come with implications. Whereas the case company is currently accustomed in managing all the resources in one office. The additional branch requires the management team to divide its focus and resources such as key personnel amongst multiple office. Development and investment in resources planning, communication, and collaboration through for example online platforms, must be considered.

The pricing strategy for the government segment aims at lower pricing than the competition without giving up quality and profits. This is considered important because governments will award the company that offered the lowest price. It is equally important to keep the quality and profits for the sake of business continuity. Hence, the only way to overcome competition is to have the ability to decrease supplier costs, lower than the competition. Control over supplier pricing can be attained through strategic alliances like partnership and vertical integration.

Unlike in the government client segment, the private sector will not automatically pick the lowest price. Thus, an equal to higher competitive pricing strategy is advised. In this case, the prices are equal or even higher than the competition. To overcome the competition, the brand reputation of the company and features or benefits of the services provided being more premium compared to others justify the higher pricing. The extent of the justification of a higher price in relation of the premium is an aspect that must be further evaluated on a per case-based situation.

For the new product/service segment consumer exhibition, a penetration pricing strategy can help to grow market share. However, to grow market share one should not merely rely on the pricing strategy. A good approach in terms of the exhibition concept itself, marketing and execution are equally important.

The proposed staging should be carefully reviewed and assessed against new market developments. The pandemic has not yet ended at the time of writing this paper.

Moving into the new markets and industry through the proposed diversification is based on the advised quantitative research results where only the markets and industries with some commonalities have been picked. While the bigger corporate picture and benefits are clear, the execution of this strategy comes with implications. These areas of Professional Training & Coaching and Media Production are new for the case company. The company should invest in hiring experts in these fields and/or form a strategic alliance through a joint venture or M&A with existing companies or start-ups to develop these new businesses.

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Paper 23

The Impacts of Fast Food Brand Collaboration Experience
on Brand Love, Brand Prestige, Brand Satisfaction, Brand
Trust, and Brand Loyalty

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Abstract - Brand loyalty is one of the vital competitive advantages firms seek to hold their position in the market. With increased competitiveness in the fast-food market, this variable has become more significant to be researched. Some antecedents such as brand experience, brand love, brand prestige, brand satisfaction, and brand trust were depicted can generate brand loyalty. This study aims to investigate the influence of these variables in generating brand loyalty from one of the American Fast-Food brand case. A quantitative survey method was utilized in the data collection, extracting a total of 258 responses from customers aged between 18 to 24 years old. This study performed descriptive statistics and PLS-SEM for data analysis and the result shows a significant indirect influence of brand experience to brand loyalty through mediators of brand love, brand satisfaction, and brand trust. Brand experience is also identified to have an impact on brand prestige. This study contributes to consumer-brand relationships understanding by demonstrating the causal relationships and providing valuable insights to future researchers and fast-food marketers.

Keywords - Brand experience, brand love, brand loyalty, brand prestige, brand satisfaction, brand trust

I. INTRODUCTION

A. Background

McDonald's is an American fast-food restaurant that is famous for its hamburgers menu [1]. Franchising 32,000 outlets in 119 countries on 6 different continents, McDonald's is currently holding a title as the market leader of the fast-food industry [2]. However, major trends and shifts may sway McDonald's from its current position as the trend shows an increase in the number of new fast-food restaurants, resulting in more competitors coming shortly and more competitive the industry is [3].

The weakening McDonald's competitiveness causes McDonald's overall performance is vital at this point. However, assessed through the profitability evaluation, McDonald's profit was highlighted as weak and the declining revenue had greatly impacted the profitability [4]. On the other hand, competitors are starting to overtake McDonald's. In comparison, McDonald's revenue growth in the beginning two quarters in 2021 was lower than the average of similar businesses [5]. The same report also

claimed that McDonald's lost its market share within the same industry as well and it is proven by its declining customer traffic.

As the effects of overtaking competitors start to rise, one of the strategies implemented by McDonald's is by strengthening branding through brand collaboration. Brand collaboration is perceived to be able developing competitive advantage and increasing market share [6], [7]. Due to these benefits, it is understandable why McDonald's partnered up with celebrities in the newest campaign.

Recently, McDonald's united with a South Korean global boy group, BTS, releasing a famous order called BTS Meal which then had gained massive recognition in Indonesia. As cited from [8] and [9], BTS Meal offered a package of 9 pieces of chicken nuggets, fries, and drink served with the BTS members' top-picked sauces. BTS Meal became more special due to the exclusive purple packaging which gave the collaboration a stronger identity. This collaboration is a crucial strategy that successfully increased customer traffic which has become a challenge for McDonald's [10]. It is also reported that BTS Meal has contributed to the rising revenue in the second quarter of 2021 [11]. However, despite these remarkable results, there are no studies that discuss the effect of this collaboration for a long term.

As the main target of this collaboration is to enhance competitive advantages, a specific assessment is essential to be made. This assessment can be made by linking the competitive advantage concept to the brand loyalty which is perceived as a source of competitive advantages [12], [13]. Brand loyalty itself can be generated from the nurture of brand experience in which brand collaboration is mentioned as one of the factors [14]. Moreover, many past studies also found the positive influence of brand experience in fostering brand loyalty indirectly through brand love, brand prestige, brand trust and brand satisfaction [15], [16], [17]. Thus, this study aims to find the relationship of BTS Meal collaboration in generating the competitive advantage through the assessment of customer's brand experience in promoting brand loyalty directly and indirectly with brand love, brand prestige, brand satisfaction, and brand trust as the mediating factors.

B. Literature Review

1. Brand Experience and Brand Love

Brand experience is conceptualized as subjective responses related to human's internal and behavior that arouses from brand-related stimuli such as brand's design and identity, packaging, communications, and environments [14]. Brand experience is one of the components that should be considered deeply by brands when developing an emotional relationship with consumers [18]. Offering extraordinary and noteworthy experiences will be the key for brands to develop stronger emotional customer relationships [19]. Thus, it is common to link brand experience with the emotional dimension, namely love and emotional attachment among these dimensions. Many past studies have revealed the significant influence of brand experience on brand love [17], [20], [21]. Brand love itself is a social psychology concept deliberating the passionate affection consumers have towards a brand [20], [22]. Consumers who emotionally attached with one brand can be assumed as a brand love [17], [20]. Developing brand experience will generate pleasant feelings for customers and strengthen the emotional bond with a brand. Based on the previous arguments, brand experience is found to have an impact on brand love. Hence, this study will test the following hypothesis:

H1: Brand experience significantly influences brand love.

2. Brand Experience and Brand Prestige

Brand prestige is referred as a "subjective evaluative judgment" towards a high social status of brands that is evoked from a positive and excellent accomplishment [23]. As more consumers purchase products for the hedonic and social value they have, it is critical to enhancing the brand prestige by leveraging the brand experience through interactive tools and advertisement [17], [24]. With the shifting concept of "luxury", experience and indulgence have become newly discovered factors to where the concept further leaning on [25]. The influence of brand experience has been deliberated in many earlier studies. It was acknowledged that brand experiences and brand personality traits directly influence brand prestige [24]. Some studies even mentioned the significant all sub-dimensions of brand experience in generating brand prestige. Hence, this study will test the following hypothesis:

H2: Brand experience significantly influences brand prestige.

3. Brand Experience and Brand Satisfaction

Satisfaction is defined as post-purchase evaluation involving "psychological" and "emotional" matters towards product quality over the expectations given before the

purchase [26], [27], [28]. Satisfaction can be gained through the positive experience of consumers [29]. Thus, brand experience which arises when consumers search, purchase, and consume the brands, can have a positive effect on brand satisfaction [16]. It implies that a brand with great experiences will increase customer satisfaction which had been supported by many previous studies [14], [29]. Hence, this study will test the following hypothesis:

H3: Brand experience significantly influences brand satisfaction.

4. Brand Experience and Brand Trust

Experience is more impactful than product features and benefits as it provokes stronger remembrance that can grow customer trust in the respective brand [30]. Constant positive experiences will reinforce customer expectations for next purchases, believing a brand will have the capacity to offer or even exceed the expected benefits [31]. Thus, customers will feel more secure when a brand can grant the promised performances over time [32]. This reflects how brand experience is able to influence brand trust. Brand trust is conceptually defined as the willingness of consumers in relying on the brand's ability to perform the stated function which diminishes the vulnerability among consumers caused by environmental uncertainty [33]. On the basis of this discussion, it is suggested that brand experience can lead to an increase of brand trust. Hence, this study will test the following hypothesis:

H4: Brand experience significantly influences brand trust.

5. Brand Love and Brand Loyalty

Nowadays, consumers do not make decisions based on rational factors only, instead, the emergence of emotional attachment had transformed their behaviors, resulting in the new appearance of the brand love concept [34], [35]. Brand love is perceived to be a meaningful mode of consumer satisfaction that triggers post-consumption behavior, such as loyalty [36]. Reference [37] adopted the "brand loyalty" term to indicate a constant preference over a while in individuals' life. It can be assumed that consumers who have brand love towards a brand will produce a stronger loyalty that will enhance specific traits, including repetitive buying. Hence, this study will test the following hypothesis:

H5: Brand love significantly influences brand loyalty.

6. Brand Prestige and Brand Loyalty

Signaling a social status and self-worth, purchasing prestigious brands can elevate one's confidence, especially for young generations who are seeking acceptance from their surrounding which then will influence their attitude and loyalty of them [38], [39], [40]. The direct relationship

between these variables had been demonstrated by past studies in many contexts [41], [42]. Based on these arguments, it is suggested that brand prestige has an impact on brand loyalty. Hence, this study will test the following hypothesis:

H6: Brand prestige significantly influences brand loyalty.

7. Brand Satisfaction and Brand Loyalty

The maintenance of satisfaction will influence the firm's success [43]. Consumers of brands with high satisfaction have a lower elasticity of repurchase intentions, compared to brands with lower satisfaction [44]. Additionally, the high satisfaction also implies a long-run reputation effect. Furthermore, brand satisfaction is one of the keys in developing brand loyalty that is able to retain existing customers and preserve a long-term relationship, resulting in a source of competitive advantage [12], [13]. Hence, this study will test the following hypothesis:

H7: Brand satisfaction significantly influences brand loyalty.

8. Brand Trust and Brand Loyalty

Brand trust is found to be one of the key determinants of brand loyalty which is consistent with the one-to-one marketing relationships concept [33]. Trust can lead consumers to obtain high-value exchange relationships [45]. The brand trust acquired from high-quality products, valuable benefits, and satisfaction can drive a commitment to one's brand, generating repetitive purchase behaviors in the customers [46]. Hence, this study will test the following hypothesis:

H8: Brand trust significantly influences brand loyalty.

9. Brand Experience and Brand Loyalty

Brand experience is considered a strong predictor of actual buying behavior because the stimulation-seeking organism may attempt to experience such stimulations repeatedly [14]. In alignment with these findings, [16] also pointed out that brand experiences will result in pleasurable outcomes desired repetitively by consumers. Therefore, it is essential to apply distinctive experiences in all brand touchpoints in order to strengthen the brand loyalty of consumers [47]. Hence, this study will test the following hypothesis:

H9: Brand experience significantly influences brand loyalty.

C. Conceptual Framework

The proposed conceptual framework for this study is as shown in Fig. 1. The framework is constructed from two studies [16], [17].

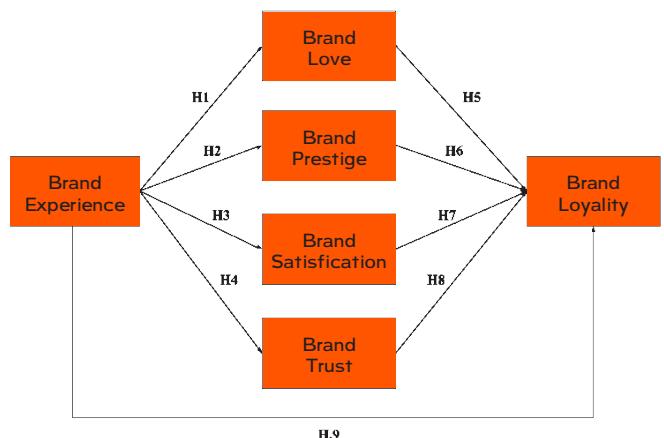


Fig. 1. Conceptual Framework

II. METHODOLOGY

To fulfill the research objective, this study will use a quantitative approach. A quantitative approach is a way to interpret an observed phenomenon in numerical presentation, calculated with mathematical and statistical-based methods [48]. This research approach will be adopted to quantify the extent of significance in each variable relation. This research will also use survey method by dispersing questionnaires for cost efficiency and time-saving data collection [48].

A. Research Population and Sample

The population of this study covers the younger generation consumers of McDonald's BTS Meal in Indonesia which had bought the menu set at least once. The population will be targeted into an age group of 18 to 24 years old as this group was evaluated to be grown significantly within the previous McDonald's Famous Orders campaign [49].

According to rule used in [50], as depicted in Table I, 200 is the minimum number of sample sizes for marketing test-studies, including the present study. Subsequently, this study collected 302 respondents with pre-determined characteristics as above to be analyzed.

Table 1 - SAMPLE SIZES USED IN MARKETING RESEARCH STUDIES

Type of Study	Type of Study	Type of Study
Problem identification research (e.g. market potential)	500	1,000-2,500
Problem-solving research (e.g. pricing)	200	300-500
Product tests	200	300-500
Test-marketing studies	200	300-500
TV/radio/print advertising (per commercial or ad tested)	150	200-300
Test-market audits	10 stores	10-20 stores
Focus groups	2 groups	6-15 groups

Non-probability sampling is chosen for this research. Non-probability sampling is a sampling method where the probability of a subject being selected is unknown because of the absence of statistical principle in randomness which results in bias [51], [52]. Although four categories construct non-probability sampling as mentioned in [50], this research will only be adopting judgmental sampling. Judgmental sampling is defined as a form of convenience sampling that selects population elements according to the researcher's subjective judgments. Due to the existence of pre-determined population characteristics set by the author before the research, the judgmental sampling technique is chosen.

B. Profile of Respondents

Table 2 - PROFILE OF RESPONDENTS

	Characteristics	Frequency	Percentage
Age	18 - 24 years old	258	100
Gender	Female	252	97.7
	Male	6	2.3
Income per Month	< Rp5.000.000	236	91.5
	Rp5.000.000 -	19	7.4
	Rp10.000.000		
	> Rp10.000.000	3	1.2
Domicile	Java	215	83.3
	Sumatra	19	7.4
	Kalimantan	4	1.6
	Sulawesi	6	2.3
	Bali and Nusa	12	4.7
Tenggara	Maluku	1	0.4
	Batam Island	1	0.4

C. Questionnaire Design

The questionnaire is written in Bahasa Indonesia and estimated to be filled by respondents within ten minutes. Questionnaires are developed of open-ended and multiple-choice questions for demographic-related sections and Likert scale questions for operational variable-related sections. The questionnaire was adapted from the relevant previous studies and carefully restructured to demonstrate the direct and indirect impacts of customers' brand experience towards BTS Meal on brand loyalty. A set of measurements concerning the operation variables was developed as the following summary:

Table 3 - MEASUREMENT SCALES

Constructs	Source	Label	Indicators
Brand Experience	Brakus, Schmitt and Zarantonello (2009); Kazmi and Khalique (2019)	BE1	BTS Meal by McDonald's has a strong visual impression on my visual senses
		BE 2	BTS Meal by McDonald's can attract my emotion
		BE3	I engage in physical actions and behavior when I consume BTS Meal by McDonald's
		BE4	I engage in a lot of thinking when I encounter BTS Meal by McDonald's
		BE5	BTS Meal by McDonald's provides me a positive experience
Brand Love	Carroll and Ahuvia (2006); Pan and Ha (2021)	BL1	McDonald's brand makes me very happy after creating BTS Meal collaboration
		BL2	I love McDonald's brand after the BTS Meal collaboration
		BL3	I am passionate about McDonald's brand after the BTS Meal collaboration
		BL4	I am very attached to McDonald's brand after the BTS Meal collaboration
Brand Satisfaction	Sahin, Zehir and Kitapçı (2011)	BS1	I am very satisfied with McDonald's after the collaboration
		BS2	After the collaboration, I think McDonald's did a good job in satisfying my needs
		BS3	After the collaboration, I think I made the right decision when I decided to consume McDonald's
		BS4	After the collaboration, I am addicted to McDonald's in some way
Brand Trust	Smith and Barclay (1997); Kazmi and Khalique (2019)	BT1	BTS Meal collaboration has resulted me to think that McDonald's is very honest
		BT2	BTS Meal collaboration has resulted me to think that McDonald's is very reliable
		BT3	After the BTS Meal collaboration, I trust McDonald's
		BT4	BTS Meal collaboration has resulted me to think that McDonald's gives me what it promises
Brand Loyalty	Chiou, (2006); Kuenzel and Vaux Halliday (2008)	BO1	BTS Meal collaboration has caused me to choose McDonald's if I had to do it over again
		BO2	BTS Meal collaboration has caused me to consume McDonald's because it is the best choice for me
		BO3	BTS Meal collaboration has caused me to consider myself to be a loyal patron of McDonald's
		BO4	Because of BTS Meal collaboration, I would recommend McDonald's brand to friends and relatives
		BO5	Because of BTS Meal collaboration, I intend to keep buying products from McDonald's brand
		BO6	Because of BTS Meal collaboration, I will speak positively about McDonald's brand

All the constructs will be measured by the 7-Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7). Additional demographic-related questions will also be asked in the beginning section of the questionnaire.

III. RESULTS

A. Descriptive Analysis

Table 4 - DESCRIPTIVE ANALYSIS

Constructs	Source	Label
Brand Experience		
BE1	6.341	0.936
BE2	6.05	1.261
BE3	6.349	1.313
BE4	5.26	1.587
BE5	5.019	1.541
Brand Love		
BL1	5.93	1.412
BL2	4.244	1.637
BL3	3.783	1.684
BL4	3.57	1.663
Brand Prestige		
BP1	4.519	1.583
BP2	4.748	1.641
BP3	4.5	1.634
Brand Satisfaction		
BS1	4.868	1.758
BS2	4.287	1.554
BS3	4.271	1.665
BS4	3.764	1.719
Brand Trust		
BT1	4.047	1.722
BT2	4.267	1.607
BT3	4.205	1.647
BT4	4	1.785
Brand Loyalty		
BO1	4.446	1.693
BO2	4.105	1.817
BO3	3.764	1.737
BO4	4.112	1.732
BO5	3.899	1.707
BO6	4.105	1.675

The descriptive analysis is conducted to describe relationship of each variable and summarize it before implementing the inferential analysis [53]. The descriptive analysis result of this study is presented in the Table IV. It can be seen from the table, the label of BE3 has the highest mean score while the label of BL4 has the lowest. The indicator of "I engage in physical actions and behavior when I consume BTS Meal by McDonald's" from the brand experience variable has the highest mean score which is 6.349, meaning in average, the samples are most agreed to this indicator. On the flip side, the indicator of "I am very attached to McDonald's brand after the BTS Meal collaboration" from the brand love variable has the lowest mean score which is 3.57 and interpreted as the most disagreed indicator by respondents on average.

As the mean score is incapable of determining the variability of a data set, the measures of dispersion

such as standard deviation can be a tool to describe how similar or diverse the value is [53]. Based on the descriptive analysis from the Table IV, the label of BO2 has the highest standard deviation while the label of BE1 has the lowest. It revealed that the indicator of "BTS Meal collaboration has caused me to consume McDonald's because it is the best choice for me" from the brand loyalty variable has the most diverse answers because of its highest standard deviation which is 1.817, meaning some respondents agreed to this indicator while some others did not. On the contrary, the indicator of "BTS Meal by McDonald's has a strong visual impression on my visual senses" from the brand experience variable has the most similar answers because of its lowest standard deviation which is 0.936. It shows that on average, respondents have similar answer in which agreeing to this indicator.

B. Hypothesis Testing

The Partial Least Square method is utilized in this study to identify the causal modeling within the researched conceptual framework. The framework includes brand experience, brand love, brand prestige, brand satisfaction, brand trust, and brand loyalty as variables. To calculate the relationship of all assessed variables in this study, the SmartPLS software is operated. Prior analysis, there are some examinations related to the measurement model need to be proceeded. The examinations include reliability, validity, and collinearity test. After performing these tests, this study continues to the bootstrapping procedures.

Bootstrapping is defined as a resampling technique that creates a large number of model estimations from subsamples drawn from the original data in order to calculate the significance level of each indicator's weight [54]. The significance level can be measured by computing the t-values in which it should pass the minimum value of 1.96 with 95% confidence interval to be categorized significant [55]. The following Table V shows the hypothesis testing result.

Table 5 - HYPOTHESIS TESTING RESULT

Hypothesis	Structural Path	T Value	P Value	Result
H1	Brand Experience -> Brand Love	14.634	0.000	Accepted
H2	Brand Experience -> Brand Prestige	9.344	0.000	Accepted
H3	Brand Experience -> Brand Satisfaction	12.956	0.000	Accepted
H4	Brand Experience -> Brand Trust	8.348	0.000	Accepted
H5	Brand Love -> Brand Loyalty	4.793	0.000	Accepted
H6	Brand Prestige -> Brand Loyalty	0.588	0.557	Rejected
H7	Brand Satisfaction -> Brand Loyalty	5.234	0.000	Accepted
H8	Brand Trust -> Brand Loyalty	6.820	0.000	Accepted
H9	Brand Experience -> Brand Loyalty	1.131	0.258	Rejected

Hypothesis 1 assumed that brand experience significantly influences brand love. According to the results, the T-value is 14.634 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand experience significantly influences brand love.

Hypothesis 2 assumed that brand experience significantly influences brand prestige. According to the results, the T-value is 9.344 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand experience significantly influences brand prestige.

Hypothesis 3 assumed that brand experience significantly influences brand satisfaction. According to the results, the T-value is 12.956 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand experience significantly influences brand satisfaction.

Hypothesis 4 assumed that brand experience significantly influences brand trust. According to the results, the T-value is 8.348 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand experience significantly influences brand trust.

Hypothesis 5 assumed that brand love significantly influences brand loyalty. According to the results, the T-value is 4.793 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand love significantly influences brand loyalty.

Hypothesis 6 assumed that brand prestige significantly influences brand loyalty. According to the results, the T-value is 0.588 which is lower than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is rejected and it can be concluded that brand prestige does not significantly influences brand loyalty.

Hypothesis 7 assumed that brand satisfaction significantly influences brand loyalty. According to the results, the T-value is 5.234 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand satisfaction significantly influences brand loyalty.

Hypothesis 8 assumed that brand trust significantly influences brand loyalty. According to the results, the T-value is 6.820 which is higher than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is accepted and it can be concluded that brand trust significantly influences brand loyalty.

Hypothesis 9 assumed that brand experience significantly influences brand loyalty. According to the results, the T-value is 1.131 which is lower than 1.96 at a significance level of 0.05 (confidence interval 95%). Thus, the hypothesis is rejected and it can be concluded that brand experience does not significantly influences brand loyalty.

IV. DISCUSSION

A. Brand Experience Significantly Influences Brand Love

This study revealed that brand experience significantly influences brand love in the case of BTS Meal collaboration. With a T-value of 14.634, this hypothesis, thus, is accepted.

In align to the findings demonstrated in [20], the sensory experience found in the BTS Meal collaboration may become the major driver of brand love. Sensory experiences that arouse from cognitive responses such as touching and seeing could be derived from the exclusive and limited edition BTS Meal packaging which had given this collaboration a unique identity.

The experience resulted from the BTS Meal collaboration initiated some people to change their favorite brand to McDonald's due to its menu taste. Surveys in this study also identified most people would pay a higher price for the menu which is reflecting the actions of brand love.

B. Brand Experience Significantly Influences Brand Prestige

A disclosure of the significant relationship between brand experience and brand prestige is also delivered in this study. With a T-value of 9.344, the hypothesis of brand experience in affecting brand prestige significantly, can be accepted.

Most of respondents dedicated themselves as an ARMY community members who bought the BTS Meal to signal these status. They would feel their status as an ARMY can be stronger after supporting the collaboration by buying the menu set. Even more, a premium price was not considered a problem as most of them would buy it and or pay extra to acquire the packaging only. Thus, it is believed has a great impact in elevating the brand prestige of McDonald's.

C. Brand Experience Significantly Influences Brand Satisfaction

The result of this study suggested that brand experience positively affects brand satisfaction. The T-value of this

relationship was evaluated to be 12.956, leading the H3 hypothesis to acceptable.

Although many respondents have negatively judged McDonald's Indonesia to be unprepared in anticipating the collaboration, the survey result shows most respondents are satisfied enough with the collaboration. The satisfaction may appeared from the menu price set by McDonald's. The menu price was not a problem for BTS Meal consumers, instead, most of them considered BTS Meal packaging as a merchandise that was more affordable compared to other BTS collaboration products. The packaging that was perceived as the key of this collaboration, was seen valuable in which many consumers think McDonald's treatment of this item had successfully satisfied them.

D. Brand Experience Significantly Influences Brand Trust

This study deduced brand experience as an antecedent of brand trust. This conclusion is yielded due to the accepted H4 hypothesis that has generated a T-value of 8.348 which is above the minimum acceptable value.

There were some factors that able to explain the relationship of brand experience to brand trust in this BTS Meal collaboration context. For example, the completeness of menu components. BTS Meal buyers who had an expectation of the menu items after receiving the information of what would be consisted in a package felt the need of these existence when purchasing the set.

According to the previous study, brand trust can derived from the credibility of brand's related information, brand's performance and the ability of brands in fulfilling customer needs [56]. As for the McDonald's Indonesia, there was almost none complains related to the menu's completeness, reflecting the credibility of McDonald's Indonesia in serving what they had promised.

E. Brand Love Significantly Influences Brand Loyalty

The significant relationship between brand love and brand loyalty is supported in this study. The T-value of this relationship from the hypothesis testing is detected to have reached 4.793, resulting in the hypothesis to be acceptable.

Although some respondents changed their favorite brands, many of them did not have any perception differences before and after the collaboration. Most respondents have already been liking McDonald's and even always anticipating the new menu. Thus, it is unveiled that even though most respondents encountered negative

experience (long queue, running out stock, shortened collaboration period, etc.) the strong attachment they have toward the McDonald's have strongly exist in advance, restraining them to sway their preferences. Especially, those who experienced a better service during the BTS Meal purchase. The happiness resulted from the collaboration experience boosted up the attachment towards McDonald's, strengthening the loyalty of this relationship.

F. Brand Prestige Does Not Significantly Influence Brand Loyalty

This study demonstrated the absence of significant influence of brand prestige to brand loyalty. Previously created H6 hypothesis thus is rejected due to the unacceptable T-value (0.588).

Brand prestige is perceived to have an ability in increasing individual's confidence and social status from a purchase [42]. In align to this theory, a purchase of BTS Meal may had elevated the social status of buyers, especially who proclaimed themselves as an ARMY as it could presented a stronger identity of them as a part of the community to others. However, the symbolization of this prestige may did not affect the loyalty significantly. BTS meal is a short-term event of McDonald's in which the excitement only lasts in this period. Although more than 17% of the respondents acknowledge have bought BTS Meal repetitively, this repurchasing action is found to have diminished as this particular menu has already being pulled out from sales.

G. Brand Satisfaction Significantly Influences Brand Loyalty

The relationship between brand satisfaction and brand loyalty is proven to be significant as the T-statistic shown an acceptable value (5.234).

Based on the results, it is found that most respondents were satisfied enough with the collaboration and the brand, despite the madness occurred. BTS Meal consumers engaged positively to the collaboration, even only to the fact that McDonald's will collaborate with them. It is because most of buyers were included in the ARMY community and looked for affordable merchandises in which many past BTS collaborations had only offered them premium prices to obtain special merchandises. Accordingly, this high level of satisfaction has increased the loyalty of them toward the brand of McDonald's.

H. Brand Trust Significantly Influences Brand Loyalty

Brand trust is found to be one of the antecedents of

brand loyalty in this study. With a T-value of 6.820, the hypothesis is accepted as it surpasses the minimum acceptable value (1.96).

The fast response of McDonald's in handling the overwhelming situation may become a major reason of how this brand able to maintain its reliability and responsibility. By stopping the sales temporarily in order to avoid a bigger crowd, also by communicating with consumers, McDonald's had shown their responsibility in overcoming the situation. This prevention action was possibly had been perceived by consumers positively, increasing the degree of commitment and their attitude toward McDonalds. This is highly associated with the ideas that has been advanced in [20] which correlate brand trust with attitudinal loyalty.

I. Brand Experience Does Not Significantly Influence Brand Loyalty

Unexpectedly, it is found that the relationship of brand experience towards brand loyalty does not significant. The T-value extracted in this study (1.131) did not reach the minimum acceptable value, resulting in H9 hypothesis to be rejected.

In the BTS Meal collaboration context, brand experience could not significantly influence the brand loyalty directly as there were many aspects assessed. From the survey results, respondents gave a variety of answers. Both positive and negative judgments were made by respondents on this collaboration, making the event was difficult to be evaluated its significance in increasing the loyalty. For example, some respondents may felt grateful to McDonald's for creating the collaboration but they felt unsatisfied with how the event went, resulting in the positive effect of this brand experience to the loyalty may not rise. Thus, this complex evaluative judgement may become a major of this insignificant result. Accordingly, the brand loyalty only appears in BTS Meal context if the brand experience is assessed indirectly with several mediating variables.

V. CONCLUSION

A. Conclusion

This study intents to analyze the direct and indirect impacts of customers' brand experience on brand loyalty in the context of BTS Meal by McDonald's. A quantitative approach was applied in conducting the research by performing a survey method and disseminating self-administered questionnaires. This study pertains to examining samples in Indonesia with a specific age category. Subsequently, the collected data was analyzed by utilizing descriptive analysis and the PLS-SEM method.

According to the survey results, it is identified that the brand experience of McDonald's BTS Meal has no significant impact on the brand loyalty of McDonald's if it is assessed directly. However, this study justifies that brand experience from the BTS Meal collaboration indirectly encouraged brand loyalty through mediators of brand love, satisfaction, and trust. All of these mediating variables were also found to have partial mediating characteristics, indicating that they are all categorized as partial mediating variables.

B. Recommendation

Creating a collaboration event to enhance the brand experience is the first recommendation suggested in this study. This study proves that the whole collaboration experience has resulted in great satisfaction and commitment among buyers. Fast food brands can replicate this McDonald's strategy by doing collaborative work with other artists or brands.

Brands are advised to increase brand love as it can stimulate brand loyalty. Customers with a high level of brand love have a more profound emotional link and relationship to a brand, causing this brand to be "irreplaceable" for them. This study also suggests fast food brands start concentrating on increasing brand satisfaction as it can develop brand loyalty as a consequence. Consumer's pleasant feelings and positive evaluation towards a brand form a commitment behavior in choosing the same brand for multiple purchases. Therefore, this study recommends that fast-food brands allocate more resources to identify and fulfill customer expectations to generate greater brand satisfaction.

This study has proven the significance of increasing brand trust to escalate brand loyalty. Consumers tend to minimize flaws in buying. They seek a brand that seems to be reliable and trustworthy, in which they will always buy products from brands that they perceive to have an ability to keep their promises, such as producing items or services that match the existing claims. It is suggested that fast-food brands start cultivating personalities or characteristics that enhance trust, such as being responsible and reliable.

C. Limitation and Future Research

First, this research only examines the direct and indirect relationship of brand experience to brand loyalty with mediators of brand love, prestige, satisfaction, and trust. Therefore, it is suggested that future researchers explore other variables that are predicted to play a part in the BTS Meal collaboration significantly.

Second, many respondents acknowledged that they already had a strong attachment initially to the McDonald's

brand, even before the collaboration. A comparative study may be one recommendation for future researchers as it can provide a detailed result of the customer's actual condition before and after the collaboration. Consequently, how truly influential this collaboration can be determined.

Lastly, this study is limited to BTS Meal consumers who live in Indonesia, aged between 18 and 24 years old. The BTS Meal itself is a collaboration that was available in 50 countries. The actual buyers' age range is also wider than the narrowed range in this study. Further assessment regarding this topic in a different context of demographical may be attractive to be conducted.

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Paper 24

How The Korean Wave Redefines Indonesian E-Commerce
Social Media Marketing Strategies throughout The
Pandemic

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Abstract - During the COVID-19 pandemic, it was impossible for Korean artists to perform live with thousands of spectators as usual. At the same time, fans who missed their idols performing are still required to maintain health protocols and social distancing. Some of the largest e-commerce companies in Indonesia identify this as an opportunity to bridge the longing of the fans and the medium for the artists to continue performing according to health protocols, by creating virtual concerts and various online content, while simultaneously promoting their brand and services. This study was carried out to clarify whether the creation of virtual concerts and content, that emphasizes on the Korean Wave, brings a positive impact to Indonesian E-commerce Social Media marketing strategy during the pandemic.

The research was conducted with a qualitative approach and descriptive method. We utilized data that are credible yet easily accessible, such as marketing press releases and annual reports. The research started with the development of several literature reviews to find out the key elements of social media marketing. After we identified the key elements of social media marketing, we correlated the findings with the specific breakdowns of several marketing campaigns, followed by key take outs from the official press release. Lastly, we correlated all the marketing efforts with the annual reports to evaluate whether the marketing expenditures towards Korean content was paid off.

Ultimately, we recommend Indonesian E-commerce companies to continue capitalizing on current trends and influencers, as they are proven to be a strategic instrument to increase brand awareness. However, we also recommend them to actively explore different content formats to avoid monotony.

Keywords - Indonesia, Digital Marketing, E-Commerce, K-Entertainment, K-pop, Content Creation, Social Media, COVID-19

I. INTRODUCTION

II. Background

Creating value for the customer—prioritizing the value and service above the profit—is the soul of the Marketing concept proposed by Peter Drucker.

Marketing plays an important role in business practice. It acts as a key process of several activities such as research, promotion, delivering values, and selling the goods to the target market. Applying the right marketing strategy results in increasing the number of sales and broadens the business scope, which will ultimately grow the business. Today's marketplaces are more competitive, more specialized, more globalized, and driven by technology. Companies have to adjust the strategy to survive along with the increase of the challenge.

Nowadays, the rapid development in technology has changed many sectors in human life, including marketing. In this digital era, most people are using the internet to search for what they want, including products and services. The advent of various technologies changes the way business enterprises marketed their products and services because preserving old marketing ways will cause sustainability problems. Digital marketing is different from the traditional one, based on its medium. While digital marketing utilizes digital media such as social media, traditional marketing still uses traditional media such as newspapers and magazines. Based on the Theory and Application of Business and Management Principles, development on marketing in this digital era provides much potential for products or services that are marketed, such as branding, completeness, usability—functionality, interactivity, visual communication, relevant advertising, community connections, virality, and measuring the output. With a precise utilization of digital marketing, a company can easily add value to businesses in numerous ways. Not only does digital marketing provide ease in customer point of view, but it also helps the company to reach the targeted audience in a cost-effective and measurable way.

Simultaneously, The number of internet users is increasing over time in almost every country in this world, including Indonesia. Digital report for Indonesia showed that in January 2020, there are 175.4 million internet users in Indonesia. Compared with internet users in 2019, Indonesia experienced an increase of 17%, with 25 million more internet users in 2020. In this era of the "Internet Users" and the ease of access, social networking emerges through social media, allowing people to interact without the time and distance barriers. Social media is one digital platform that can be used to create a relationship, sharing ideas, and information with others without boundaries. Social media users in Indonesia have increased by 12 million

users between April 2019 and January 2020. In January 2020, social media users in Indonesia reached 160 million with 59% penetration. The relentless feature development enables everyone not only to interact with others but also to market any products, services, or content on social media. Social media marketing itself can be defined as the utilization of social media in the process of gaining website traffic or people's attention.

Indonesian companies are now adopting this kind of marketing, one of the examples is Tokopedia—an Indonesian unicorn, a technology company specialized in electronic commerce. Marketing strategy of Tokopedia in introducing itself along with its products to the public successfully drove the popularity among Indonesian society. Besides providing a high-quality e-commerce experience, Tokopedia also builds collaboration with a famous figure to influence and attract the public's attention. One of them was Bangtan Sonyeondan (BTS) a boy group from South Korea (under Big Hit Entertainment label) with tons of fans around the world. BTS's popularity has encompassed international levels and ranked first as the most popular K-pop group around the globe. The reasons behind BTS's selection as Tokopedia brand ambassador was spilled out during Tokopedia's press release. The co-founder and CEO of Tokopedia, William Tanuwijaya, said that BTS has the same vision as Tokopedia: to create a Super Ecosystem (Tokopedia, 2019).

During the COVID-19 pandemic, it was impossible for Korean artists to perform live with thousands of spectators as usual. At the same time fans who missed their idols performing are still required to maintain health protocols and social distancing. Some of the largest e-commerce companies in Indonesia, including Tokopedia and Shopee.id, identify this as an opportunity to bridge the longing of the fans and the medium for the artists to continue performing according to health protocols, by creating virtual concerts and various online content, while simultaneously promoting their brand and services. The creation of virtual concerts and content that emphasizes on the Korean Wave not only acts as a marketing tool to promote the company's brand and services, but also creates a whole new income stream and loyal subscribers. Throughout the pandemic, numerous Indonesian E-commerce companies have opted to implement this kind of "Social Media" Marketing.

I.II. Problem Statement

The problem of the study was to investigate whether the firms' creation of virtual concerts and content that emphasizes on the Korean Wave prove that there is a positive impact to Indonesian E-commerce Social Media marketing strategy during the pandemic.

I.III. Research Question

- o What are the factors that encourage people to engage with a firm's social media content?
- o Does riding the K-wave, by doing partnerships and creating Korean content improve a company's image and public awareness?
- o Does collaborating with Korean Stars improve income for the company?

I.IV. Research Objective

To clarify whether the use of social media and influencer is an effective way of marketing both the value and the products/service of a company. (Examined through the partnership of Indonesian E-commerce companies with numerous Korean Stars.)

To showcase the trade-off of investments and benefits of implementing social influencer marketing through social media.

To propose recommendations on how to best implement Social media marketing, in Indonesian E-commerce Business.

I.VI. Scope and Limitations

The limitations of the problem are used to avoid deviation from the main problem. The following are the limitations of a final project themed social media marketing strategy of an E-commerce company.

Provide information solely relevant to the Indonesian E-commerce companies, namely Tokopedia and Shopee.id

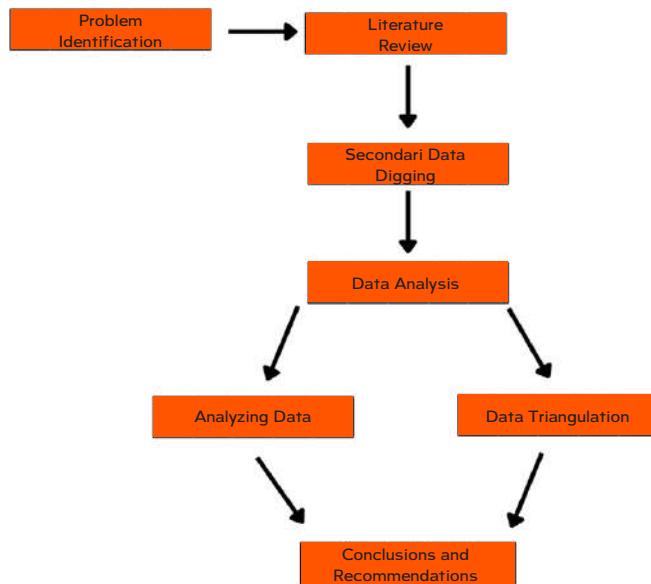
Provide an in-depth analysis of the implementation and benefits of K-Wave Content in Indonesian E-commerce Social Media marketing strategy, during the pandemic period

Provide an insight on the K-wave content development in Indonesia

Provide data and reports from the past 3 years

II. METHODOLOGY

II.I. Research design



II.II. Data Collection

Secondary Data Digging:

Secondary data is data that has been collected for purposes other than solving the problem at hand. This data can be found quickly. The step is done by cleaning data and identifying patterns in data provided by Tokopedia and SEA Limited. The next step of data digging is to find the correlation between the Marketing Strategy and Business Performance. The data we gathered from Sea Limited were the 20-F form, meanwhile from Tokopedia were the number of Korean Wave content posted on their Youtube channel, followed by each performance. Other data in this study were taken from:

- o Journal Articles
- o Annual Reports
- o Press Release
- o Observations
- o Surveys
- o Statistics

II.III. Data Analysis

The analytical method used in this research is to use a qualitative analysis method, namely the method which aims to provide a comprehensive picture of the subject under study and is not intended to test hypotheses.

There are three activities carried out in conducting data analysis including:

o Data Reduction

This stage is the process of selecting, focusing attention, abstracting and transforming rough data taken from the field. The essence of data reduction is the process of merging and uniforming all forms of data into written form that will be analyzed

o Data Presentation

After the data has been collected, we will then group similar things into categories or groups so that it is easier for researchers to draw conclusions.

o Drawing Conclusions

At this stage, we compare the data that has been obtained with data from interviews with subjects and informants which aims to draw conclusions.

The data possessed will be established into academic writings which serves the purpose of:

- o Comprehensively illustrate how the Korean Wave affect Indonesian e-commerce company's social media marketing with the support of relevant source and literature
- o To showcase the trade-off of investments and benefits of implementing "K-content" marketing through social media.
- o To propose recommendations on how to best implement Social media marketing, in Indonesian Business.

In conclusion, the aim of the data analysis is to triangulate previous studies, research, interviews, and literature regarding the application and benefits of Social Media Marketing, and serve it as a literature for business to implement and practice.

III. RESULTS

A. Figures and Tables

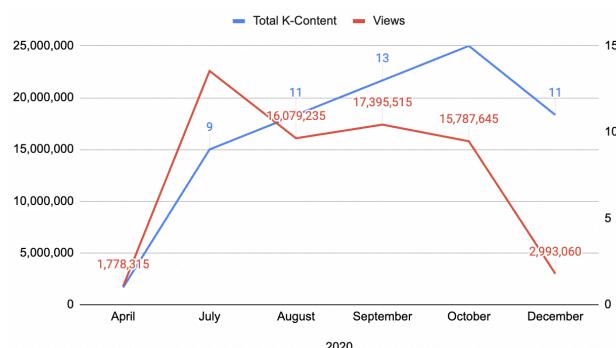


Fig. 1. Tokopedia's YouTube K-wave content Counts and Views, Year 2020

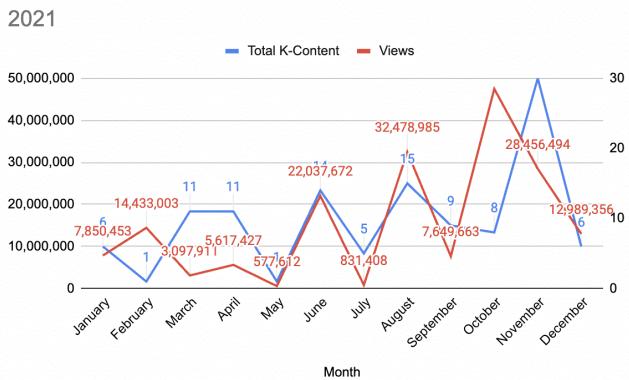


Fig. 2. Tokopedia's YouTube K-wave content Counts and Views, Year 2021

CONSOLIDATED STATEMENTS OF OPERATIONS (Amounts expressed in thousands of US dollars ("\$"))			
Note	Year ended December 31,		
	2019	2020	2021
Revenue			
Service revenue			
Digital entertainment	1,136,817	2,015,972	4,320,013
E-commerce and other services	822,659	1,777,330	4,564,617
Sales of goods	216,702	582,362	1,070,569
Total revenue	2,175,378	4,375,664	9,955,190
Cost of revenue			
Cost of service			
Digital entertainment	(435,905)	(702,129)	(1,230,062)
E-commerce and other services	(907,518)	(1,743,773)	(3,825,826)
Cost of goods sold	(227,015)	(580,677)	(1,003,547)
Total cost of revenue	(1,570,438)	(3,026,799)	(6,059,455)
Gross profit	604,920	1,348,965	3,895,735

Fig. 3. Income Statement (Source: Sea Limited Form 20-F, 2021)

IV. DISCUSSION

IV.I. Literature Reviews Findings

The development of several critical literature reviews on chapter 2 have brought us to a holistic theoretical foundation on how social media marketing initially emerged, up to the recent development of various social media marketing strategies occurring in the Indonesian E-commerce industry. We have sequentially developed 11 sub-chapters of literature reviews which serves the purpose of systematically dissecting the main elements of the research. The first literature review explains the purpose of marketing according to Peter Drucker, which is to create value for the customer and also to prioritize every aspect of value and service above profit. In relation to Indonesian E-commerce Korean Content marketing strategy, Companies are taking chances in order to prioritize their service by creating a tailored value for their customers through the implementation of various Korean Entertainment content creation that costs a fortune. The next literature review discusses the evolution of marketing based on the development of communication medium throughout the era. After we found out that the rapid growth of technology has brought changes to the way people communicate, we learned that marketers have opted to turn to social media as a platform to deliver the value of a product and/or a service. Onto the third

literature review where we specifically dissect social media marketing to its core. We have learned that the core of social media marketing is to create attractive content that will encourage its viewer to share information with their social networks. This is the birth of the modern era word of mouth. Communication between customer to the customer effectively influences the potential target market to purchase or order what is offered, increasing the number of sales (Lekhanya 2014). There are some elements to consider in order to successfully create an attractive content, which is discussed in the 2.4 Social Media Marketing Strategy literature review. The main 5 elements are Entertainment, Interaction, Trendiness, Customization, and Word of Mouth. Leading Indonesian e-commerce companies such as Tokopedia, Shopee.id, Blibli has tackled these 5 elements through the creation of virtual concerts and video content (Entertainment). User-generated content: giveaways (Interaction). Following the recent K-pop trends (Trendiness). Specifically tailored to K-pop enthusiasts (Customization) and also Word of mouth through social media. Arriving at the next finding in the literature review, Research done by Dewi et al. (2020) showed that brand ambassadors significantly affect brand awareness. Higher brand awareness can be achieved through the increase of customer's positive perception towards brand ambassadors. The brand ambassador also significantly affects the brand image. An increase in customer's positive perception towards brand ambassadors will also increase the brand image. Moreover, a brand ambassador also has a significant effect on the customer's purchase decision. The condition analysis of Indonesia proves that it is a country with a substantial amount of Korean entertainment and product consumers. Chairunnisa & Arina (2021) said that currently Korean culture is growing rapidly and expanding globally. Its existence tends to be accepted by the public from various circles, resulting in a phenomenon of "Korean Wave" or also called Hallyu. This phenomenon can be found in Indonesia and its impact is felt in everyday life, especially for the millennial generation. This has led several companies such as Shopee to carry out promotional activities using the K-Pop Boy Group Brand Ambassador named Stray Kids to maintain consumer loyalty. The results of this study indicate that there is an influence between K-Pop Brand Ambassadors on Consumer Loyalty of 0.242 or 24.2%. Another research done by Fawwaz & Indrawati (2018) BTS as Tokopedia's brand ambassador has a positive and impact significantly on Tokopedia's brand image. The appearance of BTS as a brand ambassador also gives a positive and significant impact on consumer's decision to purchase the products from Tokopedia. Moreover, there is a relation between the brand image with consumer's purchasing decisions, in which a good and powerful brand image will affect positively and significantly on consumer's purchasing decisions. Lastly, we learned that the Korean

wave has brought impact to not only the e-commerce industry but also Indonesian Business practices in general. An experimental research done by Shofwaties (2022) concluded that the existence of the Korean Wave plays a role in creative business in East Java Province. This role has been the reason for the formation of various creative businesses.

IV.II. Tokopedia Vice President of Marketing Press Release

To strengthen the claim of previous research findings, We are supporting this research with an official press release from a credible spokesperson published by a reputable journal. Hilda Kitti, vice president of marketing at Tokopedia, released an official statement solely discussing the Korean Wave marketing campaign (Yeo, S. 2022) Some of the important findings are as follows:

- o She states that the firm leveraged the power of the K-wave for its campaigns as the phenomenon felt like a natural extension of how it could reach out to more customers. "The K-wave is here to stay, and we hope to keep finding new and unexpected ways to connect with fans and customers," says Kitti.
- o The importance of staying relevant to the target audience; "At Tokopedia, we saw that several segments of our customers – like the younger age group, or female consumers – were very into K-entertainment, especially K-pop, and we decided we ought to bring these elements into our marketing so that we can better engage with our consumers." She explains
- o Content creation as a tool to educate potential consumers about e-commerce; "We use TV, Tokopedia Play – our own streaming platform – and YouTube as a mass medium," says Kitti. "It reaches many parts of Indonesia, and provides us with a way of educating people around the country about the benefits of ecommerce."
- o The vice president of marketing hopes that through the efforts of tailoring the company's marketing campaigns and the Korean Wave, Tokopedia will serve as a bridge between Indonesia and the rest of the world. "We want to bring more Indonesian culture into the mix along with these K-entertainment stars. It's not just about getting more customers on board, it's also about bringing Indonesia to a larger audience," she concludes.

As for the in-depth explanation and implementation of the Tokopedia Korean-wave marketing are as follows:

In 2021, the company appointed K-pop groups BTS and Blackpink as brand ambassadors, and it frequently features Korean artists on its monthly television show Waktu Indonesia Belanja shortened to WIB. WIB is a "shopertainment" program that airs on the 25th of every month and kicks off a sales campaign that lasts until the end of the month.

WIB is a way for Tokopedia to educate customers about its products and services. The show alternates between entertainment and promotional segments that detail the latest deals available on the Tokopedia app, such as flash sales, discounts, and cashback promotions. Initially, the show includes a variety of elements, such as comedy skits by local stars and performances by Indonesian musicians. However, Tokopedia brings K-pop stars into the program – BTS appeared on WIB in July 2020, becoming the first of many Korean groups to appear on the show.

Tokopedia increases awareness of its latest campaigns and promotions by featuring K-pop artists and other celebrities on WIB. People watch to see their favorite celebrities, while simultaneously noticing what the firm has to offer. The firm decided to hold its WIB Indonesia K-pop Awards in November 2021, featuring performances from 10 K-pop groups as well as numerous deals and promotions on the Tokopedia app, after having K-pop stars as guests on WIB for over a year.

The company accomplishes several goals by bringing K-pop idols onto Tokopedia's platform. Aside from attracting customers through the deals available during the program, it also propels Tokopedia onto the international stage, allowing fans from outside Indonesia to learn more about the company while watching their favorite stars perform.

While coordinating and monitoring performances between South Korea and Indonesia has been difficult, particularly in light of the Covid-19 pandemic, Tokopedia's efforts in incorporating K-pop into its marketing strategy have paid off. Despite being unable to provide specific figures, Kitti reveals that WIB is often the most profitable month for Tokopedia. "In terms of business performance – traffic, number of orders, number of new customers joining, et cetera – peaked during the period of WIB," she explains.

IV.III. SEA Group (Shopee.id) 2021 Annual Report

After browsing through the 20-F Form of Sea Limited-Holding Company of Shopee.id, We are able to list several key findings relevant to the purpose of this research. Some of the findings are:

- o The total revenue increased by 101.1% from US\$2.2 billion in 2019 to US\$4.4 billion in 2020. This increase was primarily due to increases in revenue from the e-commerce business and digital entertainment business.

Breakdown as follows:

- o E-commerce and other services: The e-commerce and other services revenue increased by 116.0% from US\$822.7 million in 2019 to US\$1.8 billion in 2020. This increase was primarily driven by the growth of our e-commerce marketplace, and positive developments in each of our marketplace revenue streams, transaction-based fees, value-added services, and advertising. It is a result of our commitment to continuously enhance our service offerings as we seek to create greater value for our platform users.
- o Digital Entertainment: Our digital entertainment revenue increased by 77.5% from US\$1.1 billion in 2019 to US\$2.0 billion in 2020.
- o Sales of goods: Revenue increased by 168.7% from US\$216.7 million in 2019 to US\$582.4 million in 2020, primarily due to the increase in our product offerings.

Sales and Marketing Expenses

Our sales and marketing expenses increased by 88.8% from US\$969.5 million in 2019 to US\$1.8 billion in 2020. The increase in sales and marketing expenses in 2020 was mainly from our e-commerce and digital financial services businesses. The increase in marketing expenses for our e-commerce business was primarily attributable to the ramping up of marketing incentives and brand marketing efforts, as we continue our investments to fully capture the opportunities in our markets (Sea Limited, 2021).

Gross Profit

As a result of the foregoing, our gross profit was US\$604.9 million in 2019 and US\$1.3 billion in 2020. We had gross margins of 27.8% and 30.8% in 2019 and 2020, respectively, and our digital entertainment business had gross margins of 61.6% and 65.2% in 2019 and 2020, respectively (Sea Limited, 2021).

Relevance from the annual reports findings to the research:

Sea Limited states that the increase of their revenue was primarily due to the development of their e-commerce business.

Such developments as:

- o Value-added services
- o Advertising
- o Creating greater value for the users

An increase in the sales and marketing expenditure, which includes the expenses of Shopee and Shopee.id Korean content marketing development, resulted in an increase in total revenue and gross profit.

V. CONCLUSION

V.I. Conclusion

Referring back to the research questions, the first question asks about the factors that encourage people to engage with a firm's social media content. According to several literature reviews and data findings, the main elements that encourage people to engage with a firm's social media content which most of the time act as a promotional tool, are familiarity, relatability, and interactivity. Should we be specific, in the course of the pandemic time, leading Indonesian e-commerce companies tackled the "familiarity, relatability, and interactivity" factors through the implementation of various Korean social media content that is not only entices substantial amount of the service users but also create a whole new income stream from content creation. The second question is "Does riding the K-wave, by doing partnerships and creating Korean content improve a company's image and public awareness?" The simple answer to this question is, yes. In the case of Tokopedia, By bringing K-pop idols onto their platform, the firm achieves several things. Aside from attracting customers through the deals available during the program, it also propels Tokopedia onto the international stage, allowing fans from outside Indonesia to learn more about the company when they tune in to watch their favorite stars perform. "While Tokopedia operates only in Indonesia, it shows people that Indonesia is home to businesses that can attract global stars to work with and collaborate with them. Indonesian fans also feel proud that a local company is able to do something of this scale, which helps create brand loyalty." explains Hilda Kitti, Vice President of Marketing at Tokopedia (Yeo, S. 2022, January 19). The last question is "Does collaborating with Korean Stars improve income for the company?". Referring to the 2021 Annual Report of Sea Group, parent company of Shopee.id, the company has experienced a rise in their gross profit in the course of 2 years since the 2019 fiscal year. It implies that the implementation of their K-content strategy throughout the pandemic does improve the income of the company. Moreover it displays a positive trade-off of marketing investments towards company profitability.

V.II. Managerial Recommendations

After analyzing several literature reviews regarding the key elements of social media marketing, extracting important points regarding K-wave marketing from the company's official statements, and relating to the profitability through annual reports, We provide the recommendations to be proposed to Indonesian E-commerce companies.

- o Leverage more on current trends and influencers, e-commerce companies should note that influencers are a strategic instrument to increase brand awareness.
- o Especially in the recent storm of the Korean Wave, Indonesian e-commerce companies should invest in the utilization of Korean influencers as they are proven to capture a substantial number of people and proven to be a positive trade-off of investments.
- o Maintain the development of content creation, as it is an effective tool to entice users, while exploring new formats to avoid monotony.

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KARIBAL



Paper 25

The effect of short-form videos in social media among Generation Z in their consumption towards live sports TV broadcasting

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Abstract – Short-form videos has already become mostly been applied in various social media platforms. Such form also has attracted the Generation Z the most. Some kinds of product marketing use this interesting phenomenon, including the sport field, particularly live sports TV broadcasting. This paper explores how the effect of short-form videos towards the interest of Generation Z to purchase live sports TV broadcasting. The data collection technique was conducted using online questionnaires among 219 respondents where 179 respondents are the Generation Z and the rest of it is millennials and X generation. Afterwards, the data were analyzed by conducting quantitative approach, through correlation coefficient and regression analysis. The result shows that, to some extent, there is a positive correlation between the effect of short-video form among Generation Z towards live sports broadcast consumption.

Keywords – short-form videos, generation Z, marketing

I. INTRODUCTION

Short-form videos in social media have seen a rise in popularity for the last couple of years with platforms like TikTok gaining a huge user base since their launch and with other platforms like Instagram and YouTube following suit. A short-form video is a format that can be up to 3 minutes and 20 seconds in length, and it is an effective and engaging way for businesses to reach audiences. It allows marketers to form connections and build consumer advocacy for a growing audience in a brand-safe environment. The top app that utilizes short-form videos, TikTok, has more than 1 billion monthly active users worldwide [1]. TikTok's distinct selling point is its mass approach over the content, which brings it closer to being a TV replacement than any other social platform [2].

With the ever-changing nature of the current digital world, the sports industry must adapt to how to make sure their business models adhere towards the newer generation otherwise they will lose a significant portion of the audience; thus, they must market correctly. This short-form video-based content allows for an instant and snackable user-generated content that can be consumed anywhere and anytime. It is the perfect kind of content for the younger generation, specifically Generation Z. Generation Z is defined as the generation of people born between 1997 and 2012 [3].

Generation Z typically has an attention span of 8 seconds [4]. Attention span is how long you can focus on something or spend on a task before you need a break or get distracted [5]. These changes in consumption habits have huge implications for how companies must approach a different way of marketing where traditional marketing might not catch the eye anymore of the Generation Z audience who are all over the social media platforms. This is quite evident in the live sports broadcasting industry, where they are seeing several interests decreasing from the young generation. Studies have shown that less people are watching live sports broadcasting in the younger generation with most preferring to consume their sports-related content through social media videos and highlights than watching a full live game of sports. This affects the broadcasting revenues of the industry as less people are paying for subscription television rights with the younger generation opting to go for a less expensive alternative in the form of social media sports consumption.

The role of social media in the distribution and consumption of sports content is a topic of constant debate [6]. This can be seen in how much of a challenge it is to get young people to watch sport on television with their consumer base being the children of the "pay-per-view" generation, it's hard to get them to pay an expense to watch sports on the television [7].

If the sports industry wants to attract and retain young viewers, especially Generation Z, it will have to make and work around some changes to suit them. According to [8], generation Z is a hard to please customers, tech savvy, and on-demand lifestyle, but dynamic and perceived as the loyal customers [9]. The young generation, while still watching television, are not as strictly restricted towards it as they utilize a wider selection of devices and platforms while watching. When compared to other generations, just 35% of Generation Z commonly watch live sports broadcast with Generation X and Baby boomers having 57% and 77% respectively. Generation Z mostly prefers using their mobile phones, with 65% of them using it for sports media consumption [10]. Social media has brought upon new methods of seeking and obtaining information on the market's plethora of products and services [11]. Industries now place a high value on how social media can be used to shape consumers' perceptions of brands and products and influence their purchasing decisions. Consumers are thought to be effectively adding to the promoting content with user-generated content (UGC) on

social media. They are now encouraged to interact with brands, share data with other buyers, and create content that reflects their identity [12].

It is tougher for brands and industries to market themselves in the current world with the competition of the consumer's attention getting denser to reach as the general audience is more overstimulated than ever with the abundance of information around them [4]. There is a lot of distraction for consumers from diverting their attention from what they are doing, especially for Generation Z. Generation Z averaged more than 4 hours a day on their mobile phone apps, so to retain their favour, brands must prioritize authentic, high-quality, and innovative content strategies. Generation Z's expectations, combined with their aversion to disruptive traditional advertising, will fundamentally alter the marketing landscape [13]. Because of this consumer expectation, it is critical for businesses to reconsider how they develop marketing plans and strategies. Platforms such as TikTok, Instagram and YouTube dominate the screens of the younger generation by implementing strategies that have adhered to Generation Z's needs such as short-form videos and easy-access UI which gives instant gratification that is demanded by the younger generation. Since the advent of the Internet and the exponential growth of social media, instant gratification has become the norm for consumers [14].

This research attempts to give a solution for stakeholders in the sports industry into how to appeal more towards Generation Z. For now, and in the next few years, Generation Z is going to be the dominant consumers on this planet [10]. Moreover, Araujo et al. [15] find that generation Z's consumer behavior significantly impacts their purchase intention. The objective is to investigate how the social media trends that we see in the young generation today affect the older form of entertainment i.e., live broadcast. Three research questions that to be explored are: 1) How does short-form videos factor in the Generation Z's consumption towards live sports broadcasting; 2) How can the sports industry adapt and change their business to Generation Z's consumption characteristics; and 3) What will the future of live sports broadcast be like in the digital landscape?

II. METHODOLOGY

This quantitative study focused on respondents with the following criteria: Indonesian, range from Generation X to Generation Z, and whether like to watch live sports broadcast. Moreover, the survey questions are based on the three research questions to collect the information in terms of consumer behaviour on the highlight of the match and subscription, consumer subscription with additional features, and consumer subscription within

the next five years. The survey utilized measurement through observational variables, using a 5-point Likert scale. The 5-point Likert scale starts from the lowest Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4) to the highest Strongly Agree (5). A sum of 12 statements regarding consumer behaviour, features of the live sports package, and what live sports would be in the future were included in the questionnaire. A pilot study with 5 respondents has also been conducted to measure Cronbach's alpha and justify its reliability and consistency.

The research was conducted through a deductive approach in the quantitative method of Likert Scale questionnaires as primary research directed to a sample of Generation Z questions relating to their usage of social media and consumption of sports media. Table I shows the list of questions and its variable codes. The relative importance of short form video social media in relation to live TV sports broadcast is assessed.

The sample is taken from 178 participants of Generation Z, age group 15 - 24 and all genders. The participant of the questionnaire is targeted to those who have an interest in watching sports content as live broadcast through the television or any media platform. The questionnaire is conducted online in the form of short-ended questions.

Here, data are collected by survey using questions on Google Form and sending out questionnaires through some groups on instant messaging platforms. Data were collected by distributing questionnaires mostly to Gen Z in Indonesia (Gen X and Gen Y could also be the respondent to be compared). Participants will then point how much they "agree" or "disagree" with the statement based on the 5-point Likert Scale.

Analysis of the data collected is conducted through Pearson correlation (to measures the strength of the relationship between two variables) and multivariate regression (to have a different view of the relationship between various variables). The aim of the analysis is to find out whether any of the variables influenced consumption and if any influence was positive or negative. Despite some debate about which method should be applied to Likert scale data, this study uses Pearson correlation and regression because there is an adequate sample size (more than 10 observations) [16]. The Pearson correlation formula [17] is as follows.

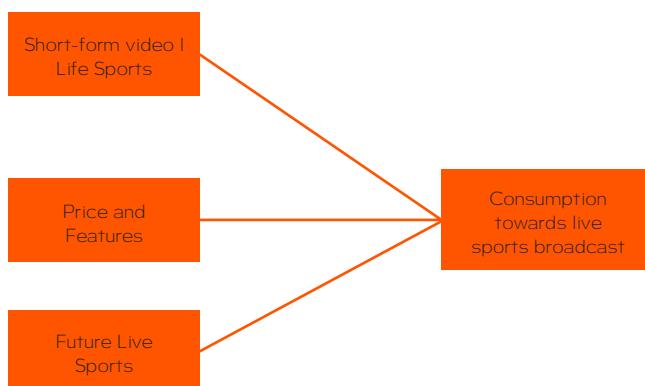
$$r = \frac{(\sum(x-\bar{x})(y-\bar{y}))}{\sqrt{(\sum(x-\bar{x})^2)(\sum(y-\bar{y})^2)}} \quad (1)$$

where x and y are vectors with length n ; \bar{x} and \bar{y} corresponds to the mean of x and y , respectively. Meanwhile, the multivariate regression formula is as follows.

$$y = mx_1 + mx_2 + mx_3 + b \quad (2)$$

where y is the dependent variable of the regression; x_i for $i = 1, 2, 3\dots$ denotes the i -th independent variable of the regression; b denotes constant.

Figure 1 shows the proposed model for this study and relate with the Table I. The short-form video | Live sports factor includes HL, Live, HLBetter, LiveBetter, HLNSubLive. The price and features of live sport broadcast package include SubDiscount, Free, LiveNFeatures, and NotInterestFeatures. The future of live sports includes Live5Yrs and InteractiveLive5Yrs.



No	Code	Question
1	HL	I like to watch the highlight of the match through social media platforms (e.g., Twitter, TikTok, YouTube etc.)
2	Live	It's fun to watch live sport broadcast either through the television or live streaming
3	HLBetter	It's more interesting to watch highlights of the match instead of live sports broadcast.
4	LiveBetter	I prefer to watch live sport broadcast from the start until the end of the match.
5	HLNSubLive	I interested to watch highlight score of the match through any media as well as subscribe the live broadcast package of my favorite sports.
6	Free	I really like the free live streaming of sport events.
7	LiveNFeatures	It's interesting if a live sport broadcast subscription package accompanied by highlight score, special merchandise, and favourite player accessibility features.
8	SubDiscount	I interested to subscribe a live sport broadcast package with price discount for a particular category (student/ employee etc.)

9	NotInterestFeatures	I'm not interested at discount price, special merchandise, and favourite player accessibility features of live sport broadcast package.
10	Live5Yrs	Within the next 5 years, live sport broadcast through television media is still interesting.
11	InteractiveLive5Yrs	Within the next 5 years, live sports broadcast that involves the audience interactively through television media is still interesting.
12	HLOnly	I only need to watch the highlight of the match through YouTube, TikTok etc. and not interested to watch live sports broadcast.

III. RESULTS

A. Result of Generation Z's Consumer Behaviour

Descriptive statistical analysis: From 219 respondents, there are 178 respondents of Generation Z. The minimum and maximum values of the scales between 1 and 5 indicate no limitation in terms of variation for the scales used. The mean values of the observed variables are different (2.80 – 4.31). The mean value of the observed variables in the consumption behaviour scale ranges from 3.53 to 4.10.

Table II shows the correlation coefficient between the variables, and its range from -0.16 to 1. Table III, IV, and V shows the coefficient of the influence variables as the result of multivariate regression.

Table 2 - CORRELATION COEFFICIENT BASED ON GEN Z DATA

Var	1	2	3	4	5	6	7	8	9	10	11	12
1	1	0.53	0.32	0.2	0.32	0.41	0.4	0.3	0.19	0.23	0.39	-0.02
2	0.53	1	0.08	0.38	0.33	0.5	0.44	0.37	0.12	0.41	0.4	-0.13
3	0.32	0.08	1	-0.08	0.24	0.22	0.15	0.1	0.18	0.05	0.27	0.19
4	0.2	0.38	-0.08	1	0.31	0.2	0.23	0.08	0.13	0.4	0.27	-0.15
5	0.32	0.33	0.24	0.31	1	0.4	0.32	0.35	0.25	0.33	0.29	0.02
6	0.41	0.5	0.22	0.2	0.4	1	0.41	0.47	-0.1	0.28	0.41	-0.16
7	0.4	0.44	0.15	0.23	0.32	0.41	1	0.64	0.03	0.29	0.41	-0.11
8	0.3	0.37	0.1	0.08	0.35	0.47	0.64	1	0.07	0.28	0.33	-0.09
9	0.19	0.12	0.18	0.13	0.25	-0.1	0.03	0.07	1	0.17	0.16	0.24
10	0.23	0.41	0.05	0.4	0.33	0.28	0.29	0.28	0.17	1	0.53	-0.08
11	0.39	0.4	0.27	0.27	0.29	0.41	0.41	0.33	0.16	0.53	1	-0.02
12	-0.02	-0.1	0.19	-0.15	0.02	-0.2	-0.1	-0.1	0.24	-0.1	-0	1

Table 3 - MODEL 1 OF REGRESSION

HLNSubLive	Estimate	Std. Error	Pr(> t)
SubDiscount	0.18457	0.07766	0.01882 *
HLBetter	0.13703	0.06702	0.04278 *
LiveBetter	0.25676	0.08223	0.00218 **
Free	3.00E-01	0.10434	0.00471 **
NotInterestFeatures	0.15059	0.05835	0.01089 *

Table 4 - MODEL 2 OF REGRESSION

LiveNFeatures	Estimate	Std. Error	Pr(> t)
SubDiscount	0.47979	0.05907	2e-13 ***
HL	0.20955	0.08012	0.00987 **
InteractiveLive5Yrs	0.19203	0.07937	0.01681 *

Table 5 - MODEL 3 OF REGRESSION

Live5Yrs	Estimate	Std. Error	Pr(> t)
Live	0.18915	0.08579	0.02908 *
LiveBetter	0.22084	0.07273	0.00285 **
InteractiveLive5Yrs	0.44506	0.08266	2.94e-07 ***

Therefore, we can obtain following linier regression equations for each model:

$$\text{HLNSubLive} = 0.18457 * \text{SubDiscount} + 0.13703 * \text{HLBetter} \\ + 0.25676 * \text{LiveBetter} + 0.29967 * \text{Free} + \\ 0.15059 * \text{NotInterestFeatures} \quad (3)$$

$$\text{LiveNFeatures} = 0.47979 * \text{SubDiscount} + 0.20955 * \text{HL} + 0.19203 * \text{InteractiveLive5Yrs} \quad (4)$$

$$\text{Live5Yrs} = 0.18915 * \text{Live} + 0.22084 * \text{LiveBetter} + 0.44506 * \text{InteractiveLive5Yrs} \quad (5)$$

There is a profiling question in the questionnaire whether the respondent likes to watch live sport broadcast (through the television or any other media)? If the answer is "No", then we still explore how their attitude towards live sports broadcast in the form of three statements and using the 5-point Likert scale as well. There are 32 respondents from 179 generation Z's respondents (18%) have answered "No". The first statement (TQ1) is "I will interest to watch the live sport broadcast through any media platforms (television, etc.) if it's an international competition". The result is 50% of them "Neutral" (undecided). The second statement is "I will interest to watch live sport broadcast through any media platforms if it's the match of my favourite club". The result is a tie between "Agree" and "Neutral" (25% each). The third statement is "I'm not interested at all on live sports broadcast". The result is 37.5 % of them "Disagree".

B. Words frequency



Fig. 2. Wordcloud of "live sport broadcast" definition from Generation Z's respondents

There is also one short question in the questionnaire which asks the respondents to define the "live sports broadcast" in three words. Based on their words, we can have the frequency of the words to identify what the things in their mind about live sports. The visualization is shown in Fig. 2, and the list of the word frequency is in the Table VI.

Table 6 - WORD FREQUENCY OF LIVE SPORT BROADCAST DEFINITION

word	frequency
fun	44
live	37
broadcast	20
interesting	14
cool	11
exciting	10
entertaining	6
entertainment	6
thrilling	6
tense	5

C. Comparison of Generation Z, Y, and X

There is some generation X and Y's respondent as well, so we can have a comparison, particularly of the model. Table VII shows the comparison of the model 1, model 2, and model 3 based on the p-value, adjusted R-square, F-statistics, and degree of freedom (DF). The comparison of independent variables is shown in Table VIII.

Table 7 - MODEL COMPARISON OF GENERATION Z, Y, AND X

Gen Z	p-value	Adjusted R-squared	F-stat	DF
Model1	2.42E-10	0.2914	F(5)=12.93	140
Model2	< 2.2e-16	0.4666	F(3) = 43.29	142
Model3	5.32E-14	0.3524	F(3) = 27.3	142
Gen Y	p-value	Adjusted R-squared	F-stat	DF
Model1	7.00E-08	0.8791	F(7) = 25.92	17
Model2	0.000381	0.5521	F(4) = 8.397	20
Model3	1.35E-08	0.8194	F(3) = 37.31	21
Gen X	p-value	Adjusted R-squared	F-stat	DF
Model1	3.85E-04	0.8093	F(3) = 17.97	9
Model2	0.0003714	0.6714	F(9) = 25.51	11
Model3	2.16E-04	0.9129	F(9) = 26.16	7

Table 8 - VARIABLES COMPARISON OF GENERATION Z, Y, AND X

	HL	Live	HLBetter	LiveBetter	Free	Sub Dis Count	NotInterest Features	Interactive Live5Yrs	HLOnly
Gen X	√	√	√	√	√	√			
Gen Y	√	√		√	√	√		√	
Gen Z	√	√	√	√	√	√	√	√	

IV. DISCUSSION

Based on the results of statistic analysis, some interesting findings are as follows.

A. Correlation coefficient and regression analysis

As we can see from the Table II, the number of columns/rows corresponding to the code in Table I, (e.g., 1 for HL, 2 for Live, and so on). Moreover, there was a significant positive correlation between the dependent variable and independent variable. For example, there was a significant positive correlation between the dependent variable LiveNFeatures and the independent variable SubDiscount r(144) = 0.64.

Furthermore, Table III, IV, and V shows that we have some significant variables for each model, as indicated by the p-value < 0.05. The obtained model corresponds to the three research questions that want to be answered. Equation (3) indicates that the short-form videos are one of the factors that affect the generation Z's consumer behavior, in terms of watching the highlight and subscribe the live sports broadcast package. The coefficient of HLBetter shows that to some extent (0.13703)

the short-form videos affecting the generation Z's consumption towards live sports broadcast. The highest coefficient is Free variable, which means that in general the cost to watch the live sports is the main consideration for generation Z.

Meanwhile, from (4) we can see that for generation Z, to subscribe the live sports broadcast package, the factors that affecting the decision are discounted by category, the short-form videos (HL) and live sports package that involves the audience interactively. Here, the coefficient of the SubDiscount as the highest means that the cost to watch the live sports is still the main consideration for generation Z. However, by providing some features of the packages such as price discounts, the highlight of the match, and interactive feature with the audience could make them want to pay for that. Therefore, the sports industry can adapt and change their business, according to this Generation Z's consumption characteristics.

The third research question might be answered by (5) where the independent variable InteractiveLive5Yrs has the highest coefficient. This means that the sports industry needs to retain the interactive feature of their product, particularly the live sports broadcast package. The future of live sports broadcast is determined by its live broadcast and interactive nature.

For the result of the generation Z's respondent who does not like to watch the live sports broadcast, we still can see the opportunity for the sports industry to also fill the gap. Although the answer of the first two questionnaire statements tends to be undecided, but the answer of the third questionnaire statement makes it clear that it depends on who's involved in the match. For example, the sports industry can offer the special package for the special occasion/ national events.

B. Words for marketing strategy

It is obvious from Fig. 2 that the generation Z's respondents perceived the live sports broadcast as a fun, live, and interesting thing to watch. Most of the top 10 words as in the Table VI are also found in the description from generation X and Y. However, there are two words on the list that only come from the generation Z, namely thrilling and tense. The sports industry may take a note of this as one of the marketing strategies of their product to attract the generation Z for purchasing the package.

C. What's characterized the generation Z?

Based on the Table VII we can see that the model 1, model 2, and model 3 of generation Z's respondent is more likely to be significantly fit compared to others. It is indicated by its smallest p-value.

Meanwhile, from Table VIII we know that the short-form videos are one of the factors that affecting the consumption of generation Z towards the live sports broadcast. The interesting finding is that although the attention span of generation Z is notoriously quite short,

but from the result we know that they still can tolerate with the longer-form video such as live sports. This is indicated by the result of HLOnly where 35.62% of them Disagree with the statement.

Another interesting finding is that only generation Z's respondent who does not care about features when cost is the priority (either free or discounted price) This should be the consideration of the sports industry as well when offering the live sports broadcast package.

The above findings, which answer the research question partly emphasize the findings by Araujo et al. [15], who investigate the influence of TikTok towards Generation Z's purchase intention, regarding the three dimensions: emotional, entertaining, and informative TikTok advertisements. They find that the three dimensions positively affect consumer behavior, and only emotional dimension positively affects the purchase intention. They also find that the Generation Z's consumer behavior significantly affects their purchase intention. Here, the result shows that the short-form videos are one of the factors that affect the generation Z's consumer behavior to watch the highlight and subscribe the live sports broadcast package. However, the most significant factor is regarding the package price instead of other various features that might involve the emotional dimension (e.g., favorite sport club or favorite players). Therefore, as the managerial implications of this are as follows. Firstly, the live sports broadcaster should think carefully about the package price more significant rather than the various features of the live sport package offered. Secondly, the next priority of live sports broadcaster should be the thought of creativity to attract Generation Z towards subscription by considering the top 10 words as presented in Table VI. Particularly the thrilling and tense, aspect that are not in the word's description of live sports broadcast from generation X and Y.

V. CONCLUSION

The generation Z is the one who has a special characteristic and the future consumer, like for the sports industry. This study has investigated the effect of short-form videos into generation Z's consumption towards live sports broadcasting. The result shows that to some extent, the short-form videos affecting the consumption of generation Z, although the price still their main concern. The result also finds that the generation Z may want to pay for watching the live sports if they can get the feature that they want, such as discounted price and other interesting features. This finding should be considered by the sports industry or live sports broadcaster when they want to design or offer their product/package to the generation Z as the target market. The generation Z also sees there is still a future for live sports broadcast if

the sports industry retains the interactive nature of their product. As for the future works, we can elaborate the investigation of what kind of the interactive nature of the sports industry product that acceptable within the next few years.

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Paper 26

The Effect of Financial Literacy on Young Millennials Investment Decision in West Java

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Abstract - The aims of this research is to determine the level of financial literacy of young millennials in West Java, analyze how financial literacy affect young millennials investment decision in West Java, and giving recommendation to improve the skills in young millennial investment decisions in West Java. The data for this research was collected through online questionnaire and distributed to 355 respondents in West Java that actively invested in capital market. The findings indicates that the level of financial literacy of young millennials in West Java is 77.65%. By using multiple linear regression, simultaneously three components of financial literacy, which are financial behavior, financial knowledge, and financial attitude have positive and significant effects on young millennial investment decision in West Java and partially financial behavior, financial knowledge, and financial attitude have positive and significant effects on young millennial investment decision in West Java. This research also suggested various parties, which are the government, financial experts, and capital market community to improve financial literacy in order to improve the skills in young millennial investment decisions in West Java.

Keywords - financial literacy, investment decision, young millennials

I. INTRODUCTION

The development of financial digitalization causes many things, one of which is the existence of online investment platforms with robo-advisory (automated) technology that becomes one of main reasons why more people are starting to invest so that the trend of investing is developing, including in Indonesia.

Currently, the number of investors has increased significantly (KSEI, 2021). According to the data from Kustodian Sentral Efek Indonesia (KSEI) as of April 2021, the number of capital market investors reached 5,088,093 Single Investor Identifications (SDIs) with this number an increase of 31.11% from the position at the end of 2020 which reached 3,880,753 SDIs with 57.40% of investors are less than 30 years old, which belongs to young millennials category.

West Java as one of the provinces in Indonesia is no exception experiencing an increase in the number of investors. West Java shares up to 20% in capital market

investment in Indonesia showed that West Java has contributed significantly to the growth of capital market investors nationally (Hoesen, 2021). Bursa Efek Indonesia in 2021 also reported that with increasing investor growth in West Java, 58.82% were investors under the age of 30.

However, the increase in the number of investors in West Java is not accompanied by the financial literacy index in West Java with a financial literacy index of only 37.43% which is lower than national financial literacy index of 38.03% and the lowest compared to other provinces in Java. In addition, a national survey from OJK in 2019 stated that young millennials have a low financial literacy index. This indicates that many young millennials invest only to follow existing investment trends without being accompanied by well-literate financial literacy. Investing itself cannot be separated from financial literacy, as Clark, Lusardi, and Mitchell (2015) stated that financial literacy is one of the factors that can affect the success of an investment. The low level of financial literacy causes investors to misinterpret data and what the numbers mean (Madi & Yusof, 2018).

Departing from the background and research gap, this research was conducted to determine the level of financial literacy of young millennials in West Java, analyze how financial literacy affect young millennials investment decision in West Java, and giving recommendation to improve the skills in young millennial investment decisions in West Java.

A. Financial Literacy

According to Morgan & Trinh (2019), financial literacy is a combination of skills and knowledge that empowers an individual to make effective decisions with all their financial resources. An adequate financial literacy will assist people with settling on no error in financial decisions later (Margaretha & Pambudhi, 2015) because financial literacy will lead to individual knowledge so that they can manage their financial resources effectively additionally for their financial security (Huston, 2010).

OECD (2013) defined financial literacy as a combination of skill, behavior, awareness, attitude and knowledge of individuals that is required to make sound financial decisions leading towards the achievement of financial well-being. Thus, this definition reveals that the three important determinants to examine financial literacy are:

- a. Financial behavior, which is a pattern of habits and behavior of individuals while arranging their finances;
- b. Financial knowledge, which refers to what individuals are familiar with personal financial matters, as measured by their level of knowledge about various personal financial concepts;
- c. Financial attitude, which is an individual's condition, opinion, or assessment of money that is applied or applied to attitude.

B. Investment Decision

Investment decision is critical and dynamic in relationship with various decision that individuals are meaning to make in lifetime for the future, so it is the principle that individuals need to know about money and be aware about the way it works, other than the availability of different financial products for investment and the concern about the adaptability in managing financial matters. For an effective investment decision, investors should adapt totally and precisely to the potential possibilities and these decisions should not be made in a surge. The inaccurate investment decision can lead organizations even to bankruptcy. It is important to comprehend the basic concepts of the investment decision to get the best incentive from the evaluation method.

Putri and Hamidi (2019) mentioned some indicators to measure investment decisions, which include:

- a. Return, which refers to a profit from an investment;
- b. Risk, with high expected returns come high risks or familiarly known, high risk high return principle;
- c. Time value of money, determining the length of investment period is critical as it determines how much profit and risk an investor should bear.

C. Millennials

According to Howe & Strauss (2000), millennials are individuals that were born between 1982-2002. Elam et al. (2007) and Ng et al. (2010) also stated that the millennial generation refers to individuals born after 1980 or, more specifically, between 1982 and 2002.

Millennials are known to be achievement-focused. They have a need not exclusively to do competently, however to succeed and outperform all objectives and desires (Kaifi et al., 2012; Kowske et al., 2010). This leads them to search out new learning opportunities. Millennials enjoy utilizing technology which the millennial generation became reliant upon innovation at a prior age than different ages.

D. Conceptual Framework

Researcher uses framework below which comprises several variables that will be used. In this framework, researcher needs to measure three variables of financial literacy from young millennials in West Java and generate the correlation between the result with young millennials investment decision in West Java. Those variables of financial literacy are financial behavior, financial knowledge, and financial attitude.

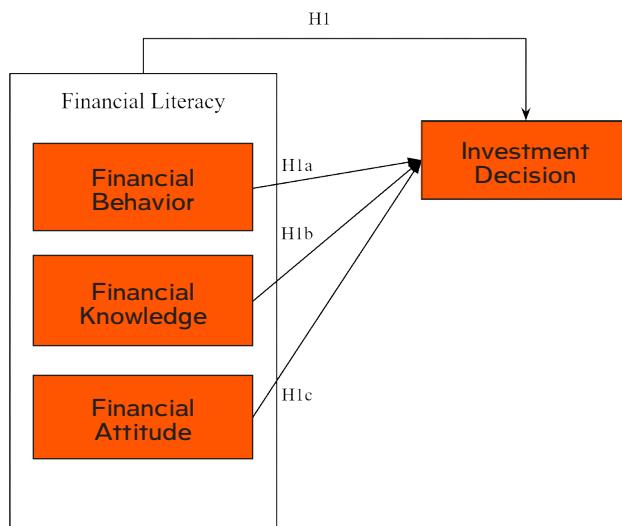


Fig. 1. Research Framework

E. Research Hypothesis

The hypothesis for this study will be stated as follows:

H1 : Financial literacy has a positive and significant effect on millennial investment decisions in West Java.

H1a : Financial behavior has a positive and significant effect on millennial investment decisions in West Java.

H2a : Financial knowledge has a positive and significant effect on millennial investment decisions in West Java.

H3a : Financial attitude has a positive and significant effect on millennial investment decisions in West Java.

II. METHODOLOGY

A. Data Collection Method

The primary data will be collected by distributing online questionnaires to young millennials who are actively invested in the capital market that are located in West Java. The questionnaire was developed mostly based on International Survey of Adult Financial Literacy which is developed by OECD. The sampling method the researcher used is convenience and purposive sampling because of the large number of young millennials in West Java.

B. Data Analysis Method

Samples totalling 355 respondents were collected using questionnaires, which were later analyzed in some stages. To analyze the data, mostly used SPSS and manual calculation in Excel. To test the validity and reliability of the questionnaire, SPSS and Excel were used. After the data passed the validity and reliability test, classical assumption test which consist of normality test, multicollinearity test, and heteroscedasticity test are conducted using SPSS. Furthermore, hypotheses were tested using Multiple Linear Regression.

III. RESULTS

A. Respondent Demographic

The demographic of the respondents will be described based on the age range, domicile, gender, profession, monthly income or pocket money, and type of capital market investment instrument owned of the respondents.

Most of the respondents that filled the questionnaire are in the age range of 20-24 which is the younger ages by reaching 210 respondents (59.15%). Whereas, the rest which is 145 respondents (40.85%) are in the age range of 25 - 29 years old.

The number of respondents vary from each city and district. The highest respondent is from Bandung City which reached 103 respondents (29.01%). In addition, the second highest and the third highest are from Bekasi City which reached 49 respondents (13.80%) and Depok City which reached 30 respondents (8.45%). Furthermore, for the cities, respondents that are from Bogor City reached 19 respondents (5.35%), respondents that are from Sukabumi City reached 9 respondents (2.54%), respondents that are from Cirebon City reached 3 respondents (0.85%), respondents that are from Cimahi City reached 13 respondents (3.66%), respondents that are from Tasikmalaya City reached 8 respondents (2.25%) and respondents that are from Banjar City reached 12 respondents (3.38%). Meanwhile, for the district, the

highest respondent is from Bekasi District which reached 17 respondents (4.79%). Furthermore, respondent that is from Pangandaran District reached 1 respondent (0.28%), respondents that are from West Bandung District reached 6 respondents (1.69%), respondents that are from Karawang District reached 3 respondents (0.85%), respondents that are from Purwakarta District reached 11 respondents (3.10%), respondents that are from Subang District reached 11 respondents (3.10%), respondents that are from Indramayu District reached 1 respondent (0.28%), respondents that are from Sumedang District reached 2 respondents (0.56%), respondents that are from Majalengka District reached 2 respondents (0.56%), respondents that are from Cirebon District reached 13 respondents (3.66%), respondents that are from Kuningan District reached 2 respondents (0.56%), respondents that are from Ciamis District reached 4 respondents (1.13%), respondent that is from Tasikmalaya District reached 1 respondent (0.28%), respondents that are from Garut District reached 3 respondents (0.85%), respondents that are from Bandung District reached 13 respondents (3.66%), respondents that are from Cianjur District reached 2 respondents (0.56%), respondents that are from Sukabumi District reached 2 respondents (0.56%) and respondents that are from Bogor District reached 15 respondents (4.23%).

More than half of all respondents which is 211 respondents (59.44%) are female respondents. Whereas, the rest which is 144 respondents (40.56%) are male respondents.

Most of the respondents are college students which is 190 respondents (53.52%). Furthermore, 124 respondents (34.93%) are private employees, 11 respondents (3.10%) are government employees, 21 respondents (5.92%) are entrepreneur, 2 respondents (0.56%) are fresh graduates, 1 respondent (0.28%) is a writer, and 1 respondent (0.28%) is a forex trader. 2 respondents (0.56%) are freelancers, 2 respondents (0.56%) are BUMN employees, and 1 respondent (0.28%) of the respondents is a jobseeker.

The majority of the respondents is those who have a monthly income or pocket money between Rp 1.000.000 and Rp 2.500.000 are 159 respondents (44.79%). Furthermore, 190 respondents (30.70%) have monthly income or pocket money between Rp 2.500.001 - Rp 5.000.000. Those with monthly income or pocket money between Rp 5.000.001 - Rp 10.000.000 are represented by 72 respondents (20.28%) and the rest of respondents which are 15 respondents (4.23%) have monthly income or pocket money greater than Rp 10.000.000.

Last but not least, the capital market investment instrument that is owned by the most respondents is stocks which accounted for 237 respondents (46.75%). Meanwhile, those who owned bonds as their type of

capital market investment instrument represented by 47 respondents (9.27%) Furthermore, 199 respondents (39.25%) owned mutual funds as their type of capital market investment instrument. Exchange Traded Fund (ETF) and Derivative only represent by 19 respondents (3.75%) and 5 respondents (0.99%) respectively.

B. Validity and Reliability Test

To assess the validity, the researcher will use Pearson Correlation test. The question is considered as valid if the value of Pearson Correlation is greater than the value of the R table (Berenson, Levine, and Krehbiel, 2012)

To assess the reliability, the researcher will use Cronbach's Alpha and Kuder Richardson (KR)-20 method. The value will be accepted if the value of Cronbach's alpha is greater than 0.7; however, values above 0.6 are also accepted (Griethuijsen et al., 2015; Taber, 2018) for the KR-20 reliability test, it is said to be reliable if the reliability value is greater than the R table value (Yusup, 2018).

Table 1 - RELIABILITY TEST

Variables	N of Items	Cronbach Alpha/R Value	Status
Financial Behavior	8	0.645	Reliable
Financial Knowledge	8	0.597	Reliable
Financial Attitude	8	0.793	Reliable
Investment Decision	8	0.777	Reliable

C. Financial Literacy Index

This research calculates the index of financial literacy based on the OECD/INFE method of calculation as well, with assessment conditions are as follows:

- o For financial behavior score, 1 point for respondents who put themselves at 4 or 5 on the scale and 0 in all other scales. After that, calculate the average of 8 questions about financial behavior where the average score is the financial behavior score. The financial behavior score takes the range 0 to 8.
- o For financial knowledge score, 1 point for respondents who answered correctly and 0 for incorrect answer. After that, calculate the average of 8 questions about financial knowledge where the average score is the financial knowledge score. The financial knowledge score takes the range 0 to 8.
- o For financial attitude score, the financial attitude score is the average of respondents' answers to 8 questions about financial attitude. The financial attitude score takes the range 1 to 5.

Table 2 - INDEX OF FINANCIAL LITERACY

Variables	Index of Financial Literacy (%)
Financial Behavior Score	83.45
Financial Knowledge Score	79.65
Financial Attitude Score	65.19
Overall Financial Literacy Score	77.65

Based on the table above, it can be known that out of 100, the financial literacy index of young millennials in West Java is 77.65%.

D. Classical Assumption Test

a. Normality Test

As can be seen in Table III, Kolmogorov-Smirnov normality test has yielded a Sig. (2-tailed) of $0.79 > 0.05$, an indicator of normal distribution of data.

Table 3 - RESULTS OF NORMALITY TEST

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		355
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	4,36877248
Most Extreme Differences	Absolute	,045
	Positive	,021
	Negative	-,045
Test Statistic		,045
Asymp. Sig. (2-tailed)		,079 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

b. Multicollinearity Test

Table IV displays a tolerance value that is greater than 0.10 (tolerance > 0.10) and a VIF that is less than 10 (VIF < 10). Both values simultaneously indicate absence of multicollinearity in financial behavior, financial knowledge, and financial attitude variable.

Table 4 - RESULTS OF MULTICOLLINEARITY TEST

Model	Collinearity Statistics	
	Tolerance	VIF
Financial Behavior	0.936	1.068
Financial Knowledge	0.939	1.065
Financial Attitude	0.995	1.005

c. Heteroscedasticity Test

As can be seen in Table V, the Spearman Rho heteroscedasticity test has each of yielded a Sig. (2-tailed) > 0.05, an indicator of heteroscedasticity does not occur in the regression model.

Table 5 - RESULTS OF HETEROSEDASTICITY TEST

Independent Variables	Sig. (2-tailed)
Financial Behavior	0.186
Financial Knowledge	0.710
Financial Attitude	0.548

E. Multiple Linear Regression

Table VI displays the findings of multiple linear regression analysis using SPSS on the effect of financial literacy that represented by three variables on young millennials investment decision.

Table 6 - RESULTS OF MULTIPLE LINEAR REGRESSION

Model	Estimate	t	Sig.
(Constant)	14.969	5.373	0.000
Financial Behavior	0.587	9.516	0.000
Financial Knowledge	0.373	2.252	0.025
Financial Attitude	0.172	4.598	0.000

This explains that investment decision would have a value of 14.969 in the result table, except for constant, if all variables have a value of zero. The value of financial behavior is 0.587, meaning that an increase in one unit of financial behavior will increase investment decision by 0.587 units. The value of financial knowledge is 0.373, meaning that an increase in one unit of financial knowledge will increase investment decision by 0.373 units. The value of financial attitude is 0.172, meaning that an increase in one unit of financial attitude will increase investment decision by 0.172 units.

F. Partial Hypothesis Test (T-test)

The partial hypothesis testing or T-test is conducted to indicate the existed correlation between independent

variables which consist of financial behavior, financial knowledge, financial attitude towards young millennials investment decision in West Java.

The existence of correlation between variable will be determined by looking at the Sig. value. The Sig. value less than 0.05 indicates that there is a correlation between independent and dependent variable. However, if the Sig. value is greater than 0.05, it can be concluded that there is no correlation between independent and dependent variable. The output from T-test statistic will be displayed in the table as follows.

Table 7 - PARTIAL HYPOTHESIS TESTING RESULT

Hypothesis	Sig.	Result
Financial behavior has a positive and significant effect on investment decisions	0.186	Accepted
Financial knowledge has a positive and significant effect on investment decisions	0.710	Accepted
Financial attitude has a positive and significant effect on investment decisions	0.548	Accepted

G. Simultaneous Hypothesis Test (F-test)

Simultaneous test of F test is conducted to analyze the significant correlation between the whole independent variables including financial behavior, financial knowledge, financial attitude towards young millennials investment decision in West Java.

The significant correlation between independent variables and dependent variable will be determined by looking at the Sig. value. The Sig. value than 0.05 indicates that there is a significant correlation between independent and dependent variable. However, if the Sig. value is greater than 0.05, it can be concluded that there is insignificant correlation between independent and dependent variable. The output from F test statistic will be displayed in the table as follows.

Table 8 - SIMULTANEOUS HYPOTHESIS TESTING RESULT

Stimulant Path	Sig.	Result
Financial behavior, financial knowledge, and financial attitude which are represented financial literacy simultaneously have positive and significant effect on young millennial investment decision in West Java.	0.186	Accepted

H. R-Square Analysis

Table 9 - R-SQUARE MODEL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.483 ^a	.483 ^a	.227	.387

a. Predictors: (Constant), Financial Attitude, Financial Knowledge, Financial Behavior

From table IX, The Adjusted R Square value shows how much the ability of the model to describe dependent variable variance has. The Adjusted R Square value is 0.227, which indicates that financial literacy that represented by financial behavior, financial knowledge, and financial attitude has an effect of 22.7% on investment decision. Other factors which were not analyzed in this research influenced 77.3%, because investment decision is not only affected by financial literacy, but also affected by other variables.

IV. DISCUSSION

Financial behavior has a positive and significant effect on young millennials investment decisions in West Java. This is supported by research from Kandpal & Mehrotra's (2018) which found that when it comes to making sensible investing decisions, behavior is crucial. The same thing with research from Mudzingiri et al. (2018) research results prove that financial behavior affects investment decisions. OJK of West Java, Bank Indonesia of West Java, and Self Regulatory Organizations (SRO) of West Java that consisting of the KSEI of West Java, Kliring Penjaminan Efek Indonesia (KPEI) of West Java, and Bursa Efek Indonesia (BEI) of West Java has carried out many programs in order to increase capital market participation and financial literacy such as "Kampanye Simpanan Pelajar", "Ayo Menabung Saham", "Sekolah Pasar Modal", "Portal Sikapi Uangmu", and so on in collaboration with securities companies, banks, and others where this is done on social media and also in the form of Web Seminars (Webinars) which also reach out to social media. Millennials prefer to spend more time using social media than interacting directly (Castela & Costa, 2019; Harmel & Yeh, 2019). The issues that frequently emerge to this generation are using a lot of instant communication technology that makes each individual's behavior change unstably (Berkovits, Moody, & Blacher, 2020; Steinsbekk et al, 2021). Accordingly, millennial life is identical to social media so that what is on social media is one that can change the behavior of a millennial, financial behavior is no exception. All of this goes back to what is in the social media of the millennial, if what is on social media encourages millennials to do positive financial behavior, it can influence millennials to follow the positive financial behavior and vice versa. Therefore, with the many financial education programs carried out on social media by West

Java financial institutions, it can affect the financial behavior of West Java millennials, such as managing cash, making savings provision for emergencies, planning longterm goals, and etc. This is one that link to financial behavior which leads to affect the investment decisions.

Financial knowledge has a positive and significant effect on young millennials investment decisions in West Java. This is supported by research conducted by Akhtar & Das (2019), which states that financial knowledge positively affects investment decisions. Sahi, Arora, & Dhameja (2013) stated that understanding individual investment decisions requires financial knowledge of various behaviors related to investor decision-making itself. In 2021, the Governor of West Java appealed to OJK and Bank Indonesia of West Java to further intensify financial literacy education in West Java. By this appeal, financial literacy education in West Java is also intensively carried out by various parties, such as OJK, Bank Indonesia, banks, universities, and others. Financial literacy education is also currently experiencing developments in its distribution media, as evidenced by the proliferation of financial literacy education conducted by Webinars and social media. With various kinds of financial literacy education that is intensively conducted, surely it will link to financial knowledge. As stated by Castela & Costa (2019) that millennials tend to spend more time using social media than interacting directly. On the other hand, millennials are familiar with a world where personal computers and information are easily accessible, and have distinct expectations concerning technology, communication, and access to information (Abram, 2006). With these millennial characteristics and financial literacy education that is being intensively conducted by various parties, certainly linked to financial knowledge. Therefore, this is one that link to financial knowledge that leads to affect the investment decisions

Financial attitude has a positive and significant effect on young millennials investment decisions in West Java. This is supported by Onodugo et al (2021) in their research that proves financial attitudes have a positive effect on investment decisions which help in determining attitudes and behaviors related to finance such as management, budgeting and making investment decisions. This is in line with the research of Dewi et al (2020) which states that there is a significant relationship between financial attitudes and one's investment decisions. Essentially, financial attitude was formed through beliefs related to economic and/or non-economic aspects believed by the individual (Ajzen, 2011). Based on this, information can influence the mindset, and attitude can affect the financial decision making process. As stated by Abram (2006) millennials are familiar with a world where personal computers and information are easily accessible, and have distinct expectations concerning technology, communication, and access to information. With the

existence of financial literacy programs in West Java which are disseminated through information technology media, it affects the financial attitude of West Java millennials, such as believing it is important to save money, making financial plans, being patient in facing financial problems. Hence, these relate to financial attitudes that lead to affect the investment decisions.

V. CONCLUSION

Based on this research, the overall index of financial literacy is 77.65%. In more detail, the index of financial behavior is 83.45%, the index of financial knowledge is 79.65%, and the index of financial attitude is 65.19%.

According to OECD (2013) that stated financial literacy is a combination of knowledge, attitude and behavior, and so it makes sense to explore these three components in combination. Set out from this, how financial literacy affects investment decisions can be seen from financial behavior, financial knowledge, and financial attitude. Based on the analysis that has been conducted, these three variables of financial literacy used in this research have positive correlation with young millennials investment decision in West Java partially and simultaneously. Financial literacy that represented by financial behavior, financial knowledge, and financial attitude has an effect of 22.7% on investment decision. For the rest were influenced by other factors which were not analyzed in this research.

Because it is proven that financial literacy has an effect on investment decisions, the recommendation that can be given is that it is necessary to improve financial literacy by strengthening financial literacy education. The role of the government is needed to intensify financial literacy education with a focus on media dissemination through social media and the form of distribution is also adjusted to the tastes and behavior of millennials. Financial experts can also play a role in increasing millennial financial literacy, such as creating educational content related to financial literacy, holding financial literacy education directly through programs that suit millennial tastes. Arranging a policy for investors to study about financial knowledge education first before investing and also after starting to invest, set up regular discussions between fellow investors or in a capital market community.

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Paper 27

Financial Literacy, Financial Inclusion, and Digital Literacy:
A Survival Kit During the COVID-19 Economic Turbulence

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ICMEM

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Abstract - The economic turmoil caused by COVID-19 pandemic has driven regulators and financial services to move towards financial technology to offer better, more efficient financial transactions that also comply with the government's health policies. These escalations are interrelated between the innovation itself and the users, categorized into three main aspects: financial literacy, financial inclusion, and digital literacy. Although these three indexes have been showing a confident rise per fourth quarter of 2021, this condition should not be treated as an absolute win against the pandemic turbulence and must be cautiously reviewed to prevent further downfall in personal finance. Therefore, this research applied the systematic review with a qualitative approach to compare evidence of financial literacy, financial inclusion, and digital literacy in Indonesia during the COVID-19 pandemic. It was found that financial inclusion is way higher than both financial and digital literacy index, with uneven distribution of financial inclusion across the country. However, the implementation of those variables has not been completely approached using sustainability viewpoint and therefore it is a joint responsibility for all stakeholders including individuals, financial services, and policymakers to elevate those towards inclusivity and sustainability to better promote eco-living and environmental long-term strategies.

Keywords - digital literacy, financial inclusion, financial literacy, personal finance

I. INTRODUCTION

The current global COVID-19 pandemic has struck almost all living sectors including the economy and financial, resulting in a global economic turmoil including Indonesia [1]. One of the tactics that is done to stabilize this crisis is by accelerating the digital economy which is contactless and complying to health protocols. Those has been developed rapidly that Indonesia ranked high in Southeast Asia [2]. These escalations in financial technology are interrelated between the innovation itself and the users, which can be categorized into three main aspects: financial literacy, financial inclusion, and digital literacy.

The improvements in the nation's financial technology can be measured using the financial inclusion index—the availability access on various financial institutions, products, and services in accordance with the needs and capability to increase welfare—which increased from 67.82% in 2016 to 76.19% in 2019 [3][4].

Another aspect that must be paid attention is the user readiness of those technologies, which can be weighed using the digital literacy index and financial literacy index. The United Nations Educational, Scientific and Cultural Organization (UNESCO) interpreted digital literacy as the ability to access, understand, and create information safely and through digital technologies [5], in which Indonesia came up with an overall medium index of 3.47 out of 5 [3]. Whereas the Financial Services Authority [4] defined financial literacy as the knowledge, skills, and confidence that affect the attitude and behavior to improve the quality of decision making and financial management to achieve welfare. By looking at the nation's understanding of financial instruments, it is concerning that the financial literacy index was only 38.09% in 2019. Although this number has been growing from the previous years of 29.66% in 2016, it is still far below than the financial inclusion index mentioned previously. These data indicate that most Indonesians do not have enough knowledge in maximizing those financial access to enhance their personal finance—the process of managing financial including income and savings—which is shown by the high discrepancy between financial literacy and financial inclusion. New concerning issues include illegal digital peer-to-peer lending services [6] and illegal investments [7], implying the unpreparedness of the population in welcoming the digital economy and thus may lead to another chaos in the micro economy and personal finance.

Based on previous studies [9][10][11], financial literacy is an essential weapon in strengthening financial resilience and facing pandemic uncertainties. As there is a notable difference between financial literacy, financial inclusion, and digital literacy index in Indonesia, further research is needed to analyze the gap in attempt to create a survival kit for individuals to withstand current fluctuation as well as to prepare for future uncertainties.

Financial literacy, financial inclusion and digital literacy are the ultimate factors in strengthening individuals during the COVID-19 pandemic unpredictability. These three financial indexes are also the key in rebuilding the current COVID-19 pandemic economic circumstance, in which per fourth quarter of 2021 has been showing a confident rise [12]. However, this condition should not be treated as an absolute win against the pandemic turbulence and must be cautiously reviewed to prevent further downfall. Strengthening the financial management abilities through increasing indexes might not be enough to create a more

resilient national financial character and thus a more holistic approach must be conducted. Thus, it is important to analyze whether the current financial literacy, financial inclusion and digital literacy in Indonesia have been conducted through a sustainable point-of-view to further participate in extending environment's sustainability for generations to come from financial decisions.

II. METHODOLOGY

The positivism approach is used as the main philosophy in conducting this research. The research variables mentioned previously, will then be arranged into a series of hypotheses, and then evaluated using systematic literature review. As the research and data collection will be focused and done at one time, specifically during the COVID-19 pandemic era, therefore it is considered as a cross-sectional study.

Literature review is one of the research methods to further firming theoretical development through the integration of various ideas and notions on previous studies [13][14]. Throughout the years, this method has been developed further in ways to increase thoroughness and are divided into three types of review: Systematic review, Semi-systematic review, and Integrative review [15]. Each approach is categorized based on its purposes, research questions, search strategy, and contributions. This research will be appropriate to use the systematic review as it has an objective to compare evidence of financial literacy, financial inclusion, and digital literacy in Indonesia during the COVID-19 pandemic. It has specific research questions of a) how the current financial literacy, financial inclusion, and digital literacy capabilities of Indonesians during COVID-19 pandemic; b) the relationship between those variables in supporting personal finance; and c) recommendations for the national's strategy in elevating those variables. It is also aiming to inform policy makers and government to overcome financial difficulties during the current pandemic. In creating a systematic literature review, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) is used as a guidance, which is an upgraded systematic review guidelines of QUOROM (Quality of Reporting of Meta-Analysis) published in 1999 [16].

III. RESULTS

Journal articles and conference proceedings will be used as the data for systematic reviews and will be taken from Scopus as the database covers internationally indexed, peer-reviewed journals across abundant number of publishers. The first step in PRISMA literature review is to identify sources that will be used as the data. The Table I on the left defines the keywords used in searching relevant papers from Scopus based on each independent

variable.

Based on the initial step, it resulted in 123 documents for

Table 1 - KEYWORDS USED IN THE SYSTEMATIC LITERATURE REVIEW

Variable	Database	Keyword
Financial literacy	Scopus	TITLE-ABS-KEY (<i>financial AND literacy AND indonesia</i>)
Financial inclusion	Scopus	TITLE-ABS-KEY (<i>financial AND inclusion AND indonesia</i>)
Digital literacy	Scopus	TITLE-ABS-KEY (<i>digital AND literacy AND indonesia</i>)

'financial literacy', 121 documents for 'financial inclusion', and 148 documents for 'digital literacy'. Further filtering is needed to pursue relevant documents according to the research scope and limitation which is shown in Table II.

Table 2 - SCREENING DOCUMENTS

Criteria	Inclusion Criteria
Open Access	All Open Access
Document Type	Article
Source Type	Journal, Conference Paper
Language	English, Indonesia
Period	2020 - 2022
Publication Stage	Final
Country/territory	Indonesia

It then resulted in 32 papers of financial literacy, 25 papers of financial inclusion, and 61 papers of digital literacy. Manual screening was then conducted by properly assessed each journal using several criteria including all papers must be conducted during COVID-19 pandemic and was conducted in Indonesia. Manual searches from ProQuest and Google Scholar were also added in attempt to further widen the collection of data. The same requirements were applied and papers in Google Scholar were checked to gather papers listed in SINTA (preferably S1 – S3). Governmental documents, reports, and national strategies in line with the research topic of financial literacy, financial inclusion, and digital literacy are included in this research to further align the current problem.

Therefore, there were a total of 35 studies of that are collected and further analyzed, consists of 14 papers from Scopus, 2 papers from ProQuest, 13 papers from Google Scholar, and 6 governmental reports.

IV. DISCUSSION

A. Financial Literacy

The economic changes during COVID-19 had tested the financial stability of individuals as well as financial performance of MSMEs. One of the essential tools in coping

this suddenness is through financial literacy, in which its knowledge and competence in managing finances will help increase problem solving related to financial difficulties. According to the Financial Services Authority [17], the financial literacy indexes in each province are listed below with the highest and lowest composite financial literacy indexes respectively in 7 major islands groups as follows:

1. Sumatera: Aceh (44.36%) Lampung (30.97%)
2. Kalimantan: East Kalimantan (39.63%), North Kalimantan (35.43%)
3. Java: DKI Jakarta (59.16%), West Java (37.43%)
4. Sulawesi: Central Sulawesi (39.63%), Gorontalo (31.23%)
5. Maluku Islands: North Maluku (37.53%), Maluku (36.48%)
6. Nusa Tenggara: West Nusa Tenggara (34.65%), East Nusa Tenggara (27.82%)
7. Papua: Papua (29.13%), West Papua (28.87%)

The financial indexes above showed that eastern provinces in Indonesia such as Nusa Tenggara, Maluku Islands, and Papua got lower results than the other western provinces. Several provinces which are at the extreme end of the islands such as Lampung and North Kalimantan also needed attention as they got lower results than the other mid provinces in the island. These latest result in financial literacy index were then tested to further assist individuals and business actors in getting through the COVID-19 challenges.

The study in Sidakarya Village, Bali [1] has proven the importance of financial literacy in reviving households' financial condition to achieve wellness through their knowledge of financial and skills to manage household finances which boosts their confidence of maintaining their financials through the hard times. The research also found that the higher index of financial literacy will help recover the financial wellbeing faster. However, it was still found that women have lower knowledge in finance than men [17][18], although the literacy gap had decreased in 2019 from 7.70% to 3.81%. The importance of balancing financial literacy for both men and women are important especially many families rely on women in managing households' financials and government's financial aid also requires housewives or woman in the household as the primary beneficiary. If we look at the fishing sector [19], the effect of pandemic did not just mainly affect fishermen but also women working in post-harvest fisheries, with financial literacy index of 20.75% in 2019. Therefore, in the scope of household, it is not only men's duty to increase their financial literacy but also women to further support households' financial performance and wellbeing.

One of the components tested in financial literacy by Lusardi is the ability to calculate interest rate and interest compounding, and that it was found to help contribute to increase individuals' interests in investing [20][21] as one of savings method. Investments are one of the ways to generate passive income, especially during the pandemic crisis which salaries and wages are affected and that many individuals got reduced amount or even got laid-off. While searching for another new job, individuals are able to spin their current money as investments to generate larger interest income than from conventional bank savings. This is where financial literacy taken its part, as a knowledge supply for individuals to invest their savings in the correct investment instruments to gain return. Without proper understandings in financials, individuals may lose their savings and gain loss instead of additional income because of their lack judgement for their investment decisions. Therefore, financial literacy has its importance in individuals' investments. On the other hand, financial knowledge also helps in understanding the access of capital, which also effects to the growing number of interests in starting a new business and thus participating in the rise of new micro and small enterprises [22].

The rapid advancement of financial technology [23] to further assist the financial needs for individuals has driven customers to leave the traditional finance and convert to a more efficient and convenient fintech service. Although financial literacy has taken participation in elevating financial technology adoption, the results have proven that other variables have a stronger effect such as financial attitude, innovativeness, and familiarity [24][25].

However, the increase in understanding financial instruments is still needed to be elevated especially for several services. The top five most frequently complained financial services based on each sector from 2013-2021 includes credit card and insurance [17], meaning that customers are not completely understand how the services work. These results indicate several problems that must be cleared. From the perspective of consumers, there may be insufficient knowledge in understanding how each service works and this shows the need to improve financial literacy about these instruments. From the perspective of financial services, there may be underperformances in offering the financial products, both from technical issues such as error systems and customer service issues such as miscommunications. These called for improvements for consumers to elevate financial literacy to better understand the usage of financial products, and for financial services to offer better services and to enlighten consumers about their financial products. It is also important to minimize technical errors and offer a more stable system for consumers to fulfil their financial necessities conveniently.

The Financial Services Authority have massively broadened the national financial knowledge through a program called "Sikapi Uangmu"—with literal meaning of 'manage your money' [26]. The program has maximized various medias to convey the knowledge for each target markets using the appropriate approach, such as illustrated story books for children, trendy catchphrases and updated social media content for young adults, and webinars and guidebook for the professionals and elderly. The classification of target audiences also includes newlyweds, MSMEs, migrant workers, and other specific occupation and financial necessities. The topics covered are also abundant from the general financial knowledge to a more advanced one, in addition of materials regarding consumer protection and dispute resolution.

By looking at the national's strategy to increase the financial literacy index, the emphasized skills are on how to understand all the finance materials that are tested as well as financial behavior and perspectives towards financial decision, mainly referred from OECD. However, discussions regarding financial decisions towards sustainability and environmental longevity are rarely found in the materials or booklets. As it is one of the global goals to convert the financial world into a more sustainable ecosystem [27], these sustainable viewpoints should be considered in elevating financial literacy index so that consumers are able to behave responsibly towards the environment through their financial decisions. Additional discourse to view financial decisions by also considering its future effect for the environment are needed with practical examples such as investing to not just merely profitable companies, but to an eco-friendly firm that implement sustainable business cycle and prioritize its stakeholders' wellness. By investing to environmentally responsible industries, individuals are able to gain returns as well as indirectly participating in the sustainable effort through their financial decision. Despite having two separate programs each dedicated to financial literacy and sustainable financial literacy, it would be better to create one interlinked program consist of the two topics for a better and time-effective integration. Therefore, each target audience will be occupied with financial knowledge using sustainability fundamentals and thus expected to behave with an ecological sustainable point-of-view for the better economic cycle.

B. Financial Inclusion

The inclusivity of financial access is also one of the important aspects in strengthening financial health for individuals and MSMEs. According to the Financial Services Authority [17], the inclusion index in each province varied as illustrated below with the highest and

lowest composite financial inclusion indexes respectively in 7 major islands groups as follows:

1. Sumatera: North Sumatera (93.98%) Lampung (61.94%)
2. Kalimantan: East Kalimantan (92.39%) North Kalimantan (65.09%)
3. Java: DKI Jakarta (97.76%) Central Java (65.71%)
4. Sulawesi: Central Sulawesi (84.51%) Gorontalo (60.89%)
5. Maluku Islands: North Maluku (75.85%) Maluku (75.62%)
6. Nusa Tenggara: West Nusa Tenggara (62.73%) East Nusa Tenggara (60.63%)
7. Papua: Papua (60.89%) West Papua (59.84%)

The notable differences between the financial access are the availability in central cities and farther provinces in this case the eastern part of Indonesia especially Maluku Islands and Papua. This condition was captured in 2019 and the current COVID-19 situation surely had a generous impact to offer more efficient financial services, increasing the overall financial inclusion index to 83.6% in 2021 [28].

The unexpected limitedness of financial services has made bank institutions and other financial services to come up with creative solutions to able to fulfil customer's financial necessity while still complying with government's pandemic regulations. Innovation in technology is the ultimate key in creating a more efficient financial ecosystem which adopted by most of the financial services. Although the financial technology has been started in 2019 [29], the digital transformation has been skyrocketing ever since the COVID-19 stroke though digital payments, digital banks, digital fundings, etc. This creates easier access for customers to digitally manage their financials as they could access all financial services by their mobile phone or other gadgets with internet connection. Financial transactions such as bank transfers, currency exchange, and payments could be done through smartphone with the help of bank mobile application and customers do not need to travel back and forth to the nearest bank branch. Customers can also easily open a new bank account with simpler requirements mainly ID card. Other popular service is the microfinancing that helps consumers' financials with lower middle income which do not have access to conventional banks, and peer-to-peer lending for consumers to have easier loan access without going through complicated process from conventional bank. This digital convert in financial services offer their financial products closer to consumers through their smartphones and simplify the traditional registration process which reduce hassle. It also helps financial

services in archiving transactions and tracking records, along with the overall efficiency of company's operational and management.

Although it is commonly believed that financial inclusion help increase resilience through financial shocks [19], it was found that the dependence on financial inclusion alone will not significantly improve financial resilience. The high index of financial inclusion does not assure of well financial shockproof as it only focuses on the financial access and does not consider the ability of customers to manage those access [30]. The rising numbers of fintech companies in Indonesia are followed with the increase in financial disputes since 2021, and that most of them came from fintech disputes [31]. Supported by the previous financial complaints along with the existing illegal financial services [6][7] in which the Financial Services Authority had closed 3,989 illegal lending services from 2018 up to April 2022 [32], the inconvenience and threat of financial inclusion are still lurking customers in accessing proper financial access. Lack of financial literacy would not be able to properly complement financial inclusion and maximize financial management as the key to strengthen financial resilience as well as financial wellbeing through COVID-19. Therefore, from the perspective of consumers, it is important to elevate financial literacy as a complementary knowledge to be able to utilize the existing financial access properly according to their financial needs as both variables are highly related [33]. The financial literacy in discussion is not only the knowledge in financial products and arithmetic calculations, but also the ability to detect suspicious financial practices to avoid financial loss.

The strategy to equally spread financial inclusion across the country is indeed fundamental to fulfil their needs in economic transactions through efficiency as well as letting them to participate in the nation's economic cycle. However, financial services will need to formulate not only preparations for expansion, but a new perspective using sustainable approach on their operational and management. The main principles that must be applied by financial services, especially in executing wider reach of digital payments are the United Nation's Principles for Responsible Digital Payments by Better Than Cash Alliance [34], with nine fundamentals as follow:

1. Digital payments should treat its consumers with fairness;
2. All funds must be guaranteed its secureness and must be accessible anytime anywhere;

3. Eliminate biases and prioritize full services and potential for women to further strengthen female enfranchisement and welfare;
4. Uphold data security and privacy by building users' trusts through user control and accountable data stewardship;
5. Provide user-centric design with relevance and quality as an inclusivity for all types of adopters;
6. Elevate transparency especially on pricing and terminologies to preserve users' trusts;
7. Offer user choice through open infrastructure and interoperability;
8. Create clear, quick, and responsive recourse to provide a more systematic help and as a powerful insight to further improve financial processes, systems, and products; and
9. Achieve a responsible ecosystem through accountability and responsibility.

These principles act as a guide and challenge for financial services to uplift their capacity and performance especially in fulfilling wider demographic needs and satisfaction. Several points above have been conducted by financial services and can be seen through their customer services and products, such as fairness to all customers, accessibilities through various access such as from smartphone and computer, and quick recourse for immediate customer help. However, further improvements are still needed to cover wider demographic customers. For example, financial applications designs have been structured similarly to ease adopters in adopting the new access, however other demographic should be paid attention such as easy operability for older generation and disabled to offer inclusivity. Data privacy and security should also be strengthened to ensure customer's data and minimize data breach. Therefore, the implementation of financial inclusion must be considering sustainability, security, and inclusivity aspects of all stakeholders to promote better efficiency and building trust in systematic, financial ecosystem.

C. Digital Literacy

The rapid growth in technology and digitalization of finance ever since the COVID-19 had intensifies the participation rate of Indonesians whether for personal or entrepreneurial. The technology including fintech also has

great benefits both for individuals to better manage their financials and maintain their financial performance [24][35] [36][37][38][39]. It was revealed by Indonesian Internet Services Provider Association on the second quartal of 2020 that the national internet usage penetration was 73.7%, which had increased 8.9% from 2018 [17]. This growth has proven that locals are able to learn technology quickly during COVID-19. The majority of internet users are connected to the internet more than 8 hours a day with an average monthly cost of IDR 75,000 – IDR 100,000. The national digital literacy index is 3.47 which is moderate, in which correlated with younger audiences, the ability to detect hoaxes, infrequent use of internet, and are not domiciled in Java. Several of these correlations helped in creating new facts to further elaborate the identity of internet users in Indonesia. The high number of internet contribution in Java (41.7%) did not reflect high digital literacy, in fact it was people outside Java which are more associated with the capability. The frequency of internet usage also contributes to digital literacy, in which high screentime does not secure high digital literacy. This condition supported Lee's findings [23] that the speed of innovations offered are way higher than the average learning period for people to properly adopt and utilize those technologies.

Retrieved from the 2020 Digital Literacy Survey conducted by Katadata Insight Center [40] in 34 provinces in Indonesia, the sub-indexes Safety and Technological Skills got the highest score of 3.66 among the others. The Safety sub-index from the Individual Safety pillar concluded that Indonesians were able to set view limitations on their posts, did not uploaded private data, nonactivated current geographical location, and able to report misconducts through the 'report abuse' option. Whereas from the Device Safety pillar, a moderate number of Indonesians were accustomed to creating passwords with combinations of numbers, alphabets, and punctuation marks. They also backed up and store their data in several medias, used software to minimize viruses, and were able to differentiate spam or malware emails. Meanwhile on the Technological, a moderate number of Indonesians were able to connect their devices to Wi-Fi, able to download files or applications from the internet, able to upload files to the internet, and able to install programs into their devices.

Unfortunately, as mentioned before, the fast adoption of people towards technology did not assure the capability to maximize the usage for a good purpose. Digital Information and Literacy got the least score of 3.17 among other sub-indexes. From the first pillar of Data Information and Literacy, there were still part of the population that could not access information and contents in the digital media according to their needs. Some also were not able to filter and store their data, as well as setting their data

search. From the second pillar which is the Critical Thinking, some of people were not habitual to find out the facts of new information they got from the internet, whether the news was fact or hoax by comparing with other reputable sources. Some of them were also still unsure on how to verify other people whom they met online and were not familiar in finding out the credibility of writers and sources.

It is resulted [41] that digital literacy is important for individuals in analyzing fintech's promotional and marketing through social media and the internet. With adequate data information and literacy, individuals are able to filter which financial technologies and apps that are legal and eligible based on their promotional. Unfortunately based on the previous data, many are not habitual in checking the information's validity, and thus falling into hoax and misinformation. This condition will also frame individuals into illegal fintech services as they are not able to differentiate which services that are legal and safe to be used. It is advised for individuals to check on the national's legal fintech list provided by the Financial Services Authority as it is regularly updated before using the related fintech to assure security and eligibility of the application.

In addition, the consideration of national's strategy in human resources empowerment and digitalization through the realization of smart manufacturing, smart cities, smart village, and smart tourism [42][43][44][45]. The readiness of digital technologies is vital to equip people to become the catalyst of the new transformations. With the support of digital literacy, it would be easier to revamp their ideas with digital perspectives to create a more efficient, sustainable ecosystem. Naturally, the implementation of digital literacy should also balance with equal internet infrastructure as there are still many underdeveloped areas in Indonesia [46]. Thus, the importance of elevating nationals' technological skills and literacy does not merely focus on the technical competencies but also how individuals are able to maximize the potential of technology itself for the greater cause.

The digital literacy elaborated earlier are related to the overall skills in utilizing technology, and the next discussion is regarding digital financial literacy which can be defined as the capabilities in understanding digital financial instruments of financial technology. With the insufficient guidance from government and international organizations, it has been compiled [47] have compiled the dimensions of digital financial literacy including:

- a. Self-protection from online financial frauds;
- b. Awareness of digital finance;
- c. Knowledge in digital financial services;

- d. Knowledge on how to do transactions through digital finance;
- e. Basic financial and digital knowledge and skills;
- f. Digital financial risk controls;
- g. Financial behaviors; and
- h. Financial decision making.

As mentioned before, the rise of financial technology has emerged during the COVID-19 pandemic and digital financial literacy is important in equipping the knowledge to maximize those fintech services. From the 2020 Indonesian Internet Service Provider Association Survey [17], 68.7% Indonesian internet users felt safe in participating in online transaction. Whereas another study [48] resulted in low understandings of financial technology between millennials in Indonesia, and that the most understandable product among the others is the digital payment. These numbers indicate the dimensions of awareness and knowledge in doing online transactions especially through digital payment, which can be seen in point B, C, and D. Whereas point A regarding safety from fintech frauds needs to be prioritized as digital literacy in fact check and identifying misinformation previously discussed is still low. These findings showed that digital financial literacy—in this case the digital literacy which focuses on the knowledge in digital finance—are essential complementary for financial inclusion that enables customers to maximize digital finance services for their financial necessities. The digital financial literacy dimensions mentioned previously should be fulfilled as means to provide security and inclusivity for all customers. The term 'digital financial literacy' itself are the combination between financial literacy and digital literacy, which covers the capabilities in managing digital finance instruments. However, the official definition of this term has not yet been structured by international organizations nor national government. National surveys from OECD's guidelines have not yet also considered these skills in digital finance into their financial literacy questionnaires to further measure the knowledge in financial technology. There is also a very limited amount of research that focuses on digital financial literacy. Therefore, there are a lot of rooms of improvement in deepening this term as it has a more focused target of utilizing financial technology than digital literacy itself which have a broader meaning as well as further research to see how this index reflected in individuals. As also mentioned in the Digital Finance Innovation Roadmap and Action Plan 2020-2024 [49], strategies in elevating digital financial literacy and infrastructure support are hoped to be conducted as scheduled or faster to reduce current digital financial risks.

D. Global Goals and Strategies

The urgency in stabilizing personal finance during COVID-19 has emerged and that this importance is aligned with previous global goals from United Nations through the Sustainable Development Goals (SDGs), which had been released pre-pandemic. This can be interpreted that the global strategies have been moving towards the right path, and that the current pandemic pushes this global implementation to be done more quickly to prevent further pandemic and, in this case, unknown pandemic and financial turmoil. The improvement in financial literacy, financial inclusion, and digital literacy especially in digital financial literacy are all in line with SDGs subpoints which is published as the 2030 Agenda for Sustainable Development [50].

Global discussions related to financial literacy, financial inclusion, and digital literacy for individuals are also brought up in the 2022 G20 Presidency of Indonesia, a multilateral forum consisting of countries with developed and rising economies. The 2022 annual international summit is being held in Indonesia as its presidency throughout the year and the climax of the series will be occurred in November 2022 in Bali with the spirit of 'Recover Together, Recover Stronger' to restructure and overcome the global COVID-19 pandemic. The discussions are focused on three main issues which are the global health architecture, digital transformation, and sustainable energy transition, which is branched into two workstreams of the Sherpa and Finance Track.

The Sherpa Track is a collection of 11 working groups of experts and relevant ministries working on specific non-finance subtopics including digital economy which is being analyzed in this research. The second issue of 'Digital Skills and Digital Literacy' covered in the Digital Economy Working Group (DEWG) confirms previous analysis and statements that digital literacy is indeed essential and have a central role in facilitating an inclusive, productive, and sustainable digital technology, as stated by the Ministry of Communication and Information Technology, Johnny G. Plate [51]. Further discussions were conducted in a hybrid form through the 2nd G20 DEWG Meeting on May 17-18, 2022, focusing on the first issue of Connectivity and Post-COVID-19 Recovery [52].

Another branch of the multilateral forum is the Finance Track, which focuses on economics and finance topics including fiscal, monetary, financial regulation and financial inclusion. There are a total of 6 priority issues in this stream [53], including the nourishment of payment systems and inclusive financial system. The Finance Track also classify their forums into six smaller groups based on related issues, such as Sustainable Finance Working Group and Global Partnership for Financial Inclusion (GPFI) that

are closely related with this research. The Sustainable Finance Working Group (SFWG) pursues deeper regarding sustainable finance as an approach to secure global growth and stability in a greener and more inclusive manner based on objectives of the 2030 Agenda and the Paris Agreement—a 2015 international treaty on climate change. The SFWG will be working on priority issues during the G20 2022 [54] to prepare finance transition.

Another working group in the Finance Track is the Global Partnership for Financial Inclusion (GPFI) which is a multilateral platform consisting of all G20 countries, interested non-G20 members, and relevant stakeholders to advance financial inclusion all over the world to increase sustainable and inclusive growth. The agenda during the G20 Presidency of Indonesia was initialized with three focused topics: digital financial inclusion, SME finance, and the OECD review of the G20 High-Level Principles on Financial Consumer Protection [55]. The three-day forum invited Indonesia Financial Services Authority and various international organizations such as the World Bank and Better Than Cash Alliance as well as industries to gather viewpoints and field experiences regarding the balance between financial technology and financial inclusion in mitigating future risks. The second meeting [56] highlighted the gender equality and inclusivity as women carried the whole economic growth and stability, and that their great contribution should be compensated with supporting facilities and embracing policies. Crucial strategies that are covered in this forum including digitalization education to improve finance capabilities.

The annual multilateral platform of G20 is an insightful cooperative way to combine various ideas, perspective, and share field experiences to create a symbiosis and collaborative strategy to withstand the global pandemic crisis. It was a global consensus to set sustainable approach as the fundamental in every strategic and policy decisions, to provide a better pandemic-free future. Financial literacy, financial inclusion, and digital literacy in fact have pivotal roles in elevating personal finance, as these topics are covered and fully discussed cross-countries through this event. Various dialogues are currently being conducted parallelly through smaller meetings and working groups. The results of all discussions will then be delivered collectively on the peak event which is the 17th G20 Heads of State and Government Summit in November 2022. Until then, financial and digital variables are hoped to be thoroughly explored among all policymakers and stakeholders to reach a brighter and more resilient future.

V. CONCLUSION

The financial inclusion in Indonesia has been increased significantly with an index of 83.6% in 2021 ever since the pandemic especially towards digital finance. However,

financial and digital knowledge to complement this access are still rather low with financial literacy index of 38.09% in 2019 and digital literacy index of 3.47 in 2020. These indexes indicate that the knowledge of individuals to properly utilize financial instruments are still lacking and that the financial services offered could not be maximized. On another note, digital literacy index mentioned covers the general skills in accessing technology and internet, and therefore did not focus on the knowledge in assessing digital financial products.

Financial literacy, financial inclusion, and digital literacy indeed play a pivotal role in creating better financial decisions and regaining financial performance from the perspective of individuals. Financial inclusion act as the supporting role in providing easy, secure, and inclusive financial access for every demographic in Indonesia. Digitalization is the go-to option for financial services to fulfil consumer's needs through financial technology and digital finance. This is where financial literacy and digital literacy—merged as digital financial literacy—come in handy, in which the collaboration of both knowledge enables one to fully maximize digital finance to fulfil their financial needs and help elevating financial performance. Therefore, the integration between these three aspects is essential as a financial weapon to combat further risks that affects individuals.

However, the implementation of those variables has not been completely approached using sustainability viewpoint. Although there are introductions to various sustainable practices for individuals to follow, an improvement in highlighting sustainable factor on financial and digital literacy is needed to promote eco-friendly living as well as to increase environmental awareness to consumers which will then elevate the demand on sustainable products and services. Thus, it will also affect business actors to provide more eco-friendly products and services, as well as using sustainable approach for their daily operation and management. Financial services will also be demanded to provide better financial access and quality to fulfil the increasing needs and will then improve the financial inclusion index. These integration between financial literacy, financial inclusion, and digital literacy with sustainability point-of-view will then impact the participation and development of personal finance towards sustainable environment and generation.

It is a joint work and responsibilities for all stakeholders including individuals, financial services, and policymakers to elevate financial literacy, financial inclusion, and digital literacy especially digital financial literacy towards inclusivity especially for women, youth, older generations, and remote residents. The sustainable approach in conducting financial and digital activities must also be implied explicitly to better promote eco-living and environmental long-term point-of-views. Several real

actions for financial services are financial trainings and hands-on through webinars and offline seminars that are customized for each target markets, for example, hands-on digital banks to improve households' financials for West Java housewives with Sundanese as primary language. This delivery method is advised to gain attention of Sundanese housewives as it uses its fluent language for better understandings as well as households' financials as its main topic which highly related to the target market. Another important aspect to be improved is the safety and security of these financial access through multiple security layers and multiple authentication login such as one-time password (OTP) to ensure consumer's trust and to eliminate digital finance risks and crime acts.

These issues are currently being discussed with a global scope through the G20 Presidency of Indonesia 2022. It is hoped that these multilateral meetings are able to collect various insights, ideas, experiences, and perspectives between regulators, industry players, consumers, and academicians and come up with unified strategies to overcome the current pandemic downfall and together achieving ideal financial resilience and prosperity.

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Change	-0.29c
Nikkei 225	24041.26
EURO STOXX 50	3808.26
S&P 500	3329.52
Nasdaq	8388.94

Currencies

£\$ Rate
1.3031
Change
-0.29c

£€ Rate
1.1745
Change
-0.07c

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Paper 28

The Effect Of Financial Literacy And Risk Perception On
The Selection Of Investment Instruments Decision Among
Generation Z In Greater Jakarta And Bandung

Moch Sukma Ghifari and Atika Irawan

ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - In the last 2 years, more people aware of the urgency of investing. Indonesian Securities Central Custodian recorded that from 2018 to 2021, investors in 4 major instruments (Stock market, Mutual Funds, Capital Market, and Government Securities) are experiencing an increase in the number of investors, ranging from 45% and 82% annually. Meanwhile, the rise of this investment intention among people in Indonesia also raised fraud investment. The recent most popular one is Binary Options fraud, promoted by their brand ambassador that will incentivize every member that joins through their referral. Previous studies found that those financially literate and have a high perception of risk will be more likely to avoid fraud investment. Therefore, this study aims to assess the effect of Financial Literacy and Risk Perception on the selection of investment instrument decisions among Generation Z in Greater Bandung and Greater Jakarta. This study used a quantitative approach with 250 respondents using a questionnaire and analyzed by PLS-SEM. To conclude, this research proves that both Financial Literacy and Risk Perception significantly and positively affected Generation - Z Investment decisions.

Keywords - Financial Literacy, Investment Decision, Risk Perception

I. INTRODUCTION

During the COVID-19 Pandemic, Indonesian people are starting to realize the importance of having a reserve fund. This makes investment one of the media for storing reserve funds which are currently booming in Indonesia [1]. This is evidenced by data from [2], the number of investors in stocks, mutual funds, Government Securities, and the capital market experienced an increasing trend from 2018 to 19 October 2021. The number of investors in the four investment instruments ranged from 45% to 82% annually. Biggest increase happen in Cryptocurrency, where 12.5 million people use cryptocurrency as their investment instruments [31]. This is good sign that Indonesia are ready to step up into the future in the Metaverse that totally related with Cryptocurrency.

However, this increase in the public interest in investments is threatened by a large number of illegal investment platforms in Indonesia. In the last 5 years, the Communication and Informatics Ministry found out and blocked 3,216 illegal investment platforms that mainly are illegal Forex platforms [3]. Not only that, earlier, there are

criminal cases related to investment fraud in Indonesia that resulted in Rp849 billion of rupiahs loss [4]. Then, there are also fraudulent digital investment cases in terms of the Binary Options instruments that are promoted as trading investments. [5] A binary option is not one of the instruments that are verified as an investment on OJK and most binary options applications are illegal in Indonesia [3]. There are several reasons why a lot of people in Indonesia become victims of fraudulent investments. One of the reason is low level of financial literacy among Indonesian people itself, according to Ketua Satgas Waspada Investasi, Tongam L Tobing [6]. Therefore, financial literacy is a very important variable in eradicating the rise of illegal investment to prevent the cases of illegal investment [7].

The increasing number of investors in Indonesia in 2022, which is expected to reach 7.75 million [8], is not in line with financial literacy for investment in Indonesia [6]. From 2011 to 2022, the Investment Alert Task Force recorded losses due to illegal investments totaling 117.5 trillion rupiah [9]. In fact, various illegal investment cases were revealed in Indonesia in 2022, with one of them causing investors to lose up to 72.13 billion rupiahs, namely the Binomo Trading case [10].

As previously stated, one of the causes of the increasing number of illegal investment cases is the increasing number of investors, which has reached 7.75 million people [8], which is not in line with the literacy rate in Indonesia, which is still at 38 percent [11], and cause damage worth trillions of rupiah [12]. According to [13], financial literacy positively affects someone's ability to detect fraud investment, which means that someone who is financially illiterate is more likely to join fraud investment. Meanwhile, financially literate people are tend to invest in assets that have a high risk-high return principle [14], but have better knowledge and are well-prepared when they face those kinds of risks [15].

According to [16], there is an influence from financial literacy towards investment decision making. According to the research when try to compare the influence between financial literacy and investment decision, investors with a high level of financial literacy are more likely to consider and try different techniques and methods when making investment decisions, compared to investors with a low level of financial literacy that more likely to not. Furthermore, based on a study conducted by [17] the investors who have higher financial literacy

resulted in better investment decision-making due to the high-quality information that has been used to decide investment decision, awareness about the decision, and rationality in choosing what kind of investment that provide the investor's capacity and needs. This findings also corroborated with the findings of [18], who stated that financial literacy influences investment decisions and that people who invest always seek information and consider it before making an investment decision.

Despite financially literate person more likely to create better decision, [19] stated in their research studies that financial literacy has no impact on investment decision in terms of profitability. It means that whether someone is financially literate or not, it will not affect how many return they get from the investment. The raised awareness of investment is happen on every generation, especially Generation-Z. According to data from Bursa Efek Indonesia (BEI), Generation Z dominated up to 81 percent of investors from a total of 7.75 million investors in Indonesia until January 21, 2022. Therefore, the purpose of this study is to determine whether Financial Literacy influences Generation Z's investment decisions when selecting an investment instrument to get better and broad insights about the condition of investors in Indonesia.

Financial Literacy and Investment Decision

According to [20] research, Financial Literacy Influences Individual Investor Investment Preferences, which means that if investors' have lower level of financial literacy, they prefer to choose deposits and foreign currency as their investment instruments. As their financial literacy become better, investors tend to create more diversified and better portfolio. Furthermore, millennials that financially literate and aware about the differences between stock and mutual funds more likely to take a risks in their investment decision, while those who are not aware with the difference is more likely to be risk-averse about their investment decision. [21]

Moreover, [17] and [18] found the same results regarding the Influences and Relationship between Financial Literacy and Investment Decisions. Those studies found that Financial Literacy affects the Investment Decision of investors before they invest their money in one of the investment instruments by mastering the instrument insight related to risk, return, etc. In contrast, [19] study found that there are no relationship between financial literacy and investment decision in terms of profitability. As a result, the following hypothesis is proposed in this study:

H1: Financial Literacy positively affects the Investment Decision

Risk Perception and Investment Decision

According to [22], Risk Perception are significantly and positively affected investors' investment decision in Tehran Stock Exchange. This statement also supported by [23] who through their research also stated that risk perception is affecting investors' investment decisions, specifically in the mutual funds market. [24] stated the similar result with different outcomes. The result also stated Risk Perception significantly affects Investment Decision, but negatively, which means that the better investors' risk perception, the less likely they will put large funds in risky investments. On the other hand, [25] and [26] stated otherwise. They came up with the same conclusion, which is Risk Perception does not have any effect on investors' investment decisions. Therefore, this study will test whether Risk Perception affects Investment Decision. The hypothesis proposed is as follows:

H2: Risk Perception positively affects the Investment Decision.

Hence, there is a conceptual model proposes in this study to examine the Effect of Financial Literacy and Risk Perception on the Selection of Investment Instruments Decision Among Generation Z in Greater Jakarta and Bandung (Figure 1)

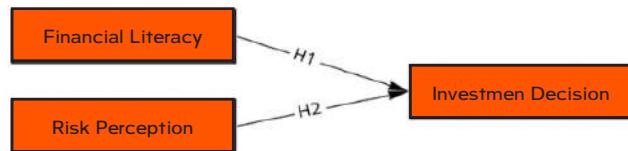


Fig. 1. Conceptual Framework

II. METHODOLOGY

In this study, researcher will used Quantitative Approach as the Research Approach. A quantitative approach is an approach to explaining a phenomenon and gathering information from the phenomenon itself using a mathematical approach [27]. This approach is used to quantify Financial Literacy, Investment Decision, and Risk Perception. To conduct the research, the researcher used questionnaire-based survey research methods. The researcher will employ the survey method, which is a method for data gathering by creating a question for the respondents [28]. In this study, the survey was conducted online through online questionnaires to the respondents, who are Gen-Z that invested in one of the instruments that have already been verified by OJK. A semi-formal structured questionnaire was used as the tool with multiple-choice and open-ended questionnaire

to collect socio-demographic and behavioral information and Likert-scale question to asses Financial Literacy, Risk Perception, and Investment Decision variable. The Likert-scale questions required respondents to select a level of agreement on a scale of one to five, with one indicating a strongly disagree answer and five indicating a strongly agree answer.

This research population is comprised of Generation Z investors that have invested within the past year. The researcher will select samples from Greater Jakarta (Jakarta, Bogor, Depok, Tangerang, and Bekasi) and Greater Bandung (Bandung and Cimahi). These regions were selected because, according to [12], DKI Jakarta and Jawa Barat are the provinces with the highest proportion of Generation Z residents, and the cities listed above are the most populous in each province.

In addition, Generation Z was selected as the topic of this study because, according to OJK Data from the year 2022, Generation Z comprised up to 88 percent of the total number of investors in Indonesia. This was one of the reasons why this generation was selected as the focus of this research. Since the target population could not be determined with any certainty, the researchers employed a sampling strategy designed for such a situation and determined that they would require 385 participants at a minimum based on the sample size calculation with a 95% confidence level of 0.5 standard deviation. Therefore, to minimize the mistakenly filled questionnaire, researchers targeted to get 400 respondents for this study.

After all the data was gathered from the questionnaires through online questionnaires via Google Form, the data will be analyzed using the Descriptive Analysis and Statistical Analysis. As the Statistical Analysis, Partial Least Square (PLS) method will be conducted it will assess the reliability analysis test, validity analysis test, collinearity analysis test, Coefficient of Determination test, Stone-Gresser (G) test, F Square Effect Size, Total Indirect and Total Effect.

III. RESULTS

A questionnaire-based survey was conducted from May to June 2022 as part of the quantitative approach analysis data collection. The survey received 467 responses, with 410 meeting the criteria and passing the screening questions. As a result, in this data analysis, we only use the 410 data points. In conclusion, the questionnaire met the third chapter's minimum sample size requirement. Those data has been collected in form of likert scale (1: Strongly disagree - 5: Strongly agree) and analyze using PLS-SEM method

Table 1 - RESEARCH MEASUREMENT

Indicator	Label	Mean
I have better understanding of how to invest my money	FL1	3.455
I am prepared to risk some of my own money when saving or making an investment	FL2	3.611
I have better understanding of financial instruments such as bonds, stock, mutual fund etc	FL3	3.249
I set long term financial goals and strive to achieve them	FL4	4.134
I have the ability to maintain financial records for my income and expenditure	FL5	3.848

Indicator	Label	Mean
A diversified portfolio reduces risk	RP1	3,888
The higher an investment's yield or rate of return, the greater is its associated risk	RP2	4,213
The investment that I choose is definitely right and will perform well	RP3	3,880
The investment I choose has good performance and convincing results	RP4	4,088

Indicator	Label	Mean
I decide my investment considering the prospects of future products	ID1	4,296
My decision is based on the references of market conditions	ID2	4,137
My decision is based on the benchmark of investment performance	ID3	4,125
The rate of return on your recent stock investment meets your expectation.	ID4	3,758
I considered the statements of government officials about the company.	ID5	3,748
I considered past performance of the firm's stock before investing.	ID6	4,066

The indicator of FL4 "I set long term financial goals and strive to achieve them" has the highest mean score of 4.134 in table 4.3 on the Financial Literacy variable, indicating that most respondents are already literate for long-term financial goals and have a desire to achieve them. For the Risk Perception variable, the highest mean score is 4.213 for the indicator RP2, "The higher an investment's yield or rate of return, the greater its associated risk," indicating that the majority of respondents have a better risk perception regarding the relationship between investment

yield or rate of return and risk. Meanwhile, the highest mean for the Investment Decision variable is 4.296 for indicator ID1, which stated "I decide my investment considering the prospects of future products." It demonstrates that the prospect of the company is the most important factor influencing respondents' investment decisions.

Hypothesis Testing

This section will explain about the PLS analysis that used to test the hypothesis as well as the significance, interpreted by the T-Values. Table 2 displays the result of hypothesis testing.

Table 2 - Hypothesis Testing

Hypothesis	Structural Path	T Statistics (T0/STDEVI)	P Values	Result
H1	Financial Literacy -> Investment Decision	6.509	0.000	Accepted
H2	Risk Perception -> Investment Decision	11.422	0.000	Accepted

According to the first hypothesis, financial literacy has a positive impact on the decision to make an investment. Because the T-statistics of this hypothesis are 6.509, which is greater than 1.96 with a significance level point of 0.05, the hypothesis is accepted. The significance level point was 0.05. As a consequence of this, we can reach the following conclusion: Financial Literacy has a favorable effect on Investment decisions.

According to the second hypothesis, risk perception has a positive impact on investment decision making. Given that the T-statistic is 11.422, which is higher than 1.96 and the significance level point is set at 0.05, this finding is significant. As a result, the hypothesis can be validated and a conclusion drawn if there is a positive influence of risk perception on investment decision-making.

IV. DISCUSSION

Financial Literacy positively affects the Investment Decision

According to the testing of the hypotheses, there is a relationship between Financial Literacy and Investment decisions. This relationship is accepted, which means that Financial Literacy has a positive effect on Investment Decisions. Due to the fact that the T-statistics is greater than 1.96 when compared to the significance level of 0.05, the hypothesis is supported. Previous research by [21], [20], [17], [29], and [18] found that financial literacy had a positive impact on investment decisions. This finding is consistent with those findings.

Moreover, according to the results of the questionnaire,

Financial Literacy has an effect on Investment Decision, which is represented by indicators ID1 (I decide my investment considering the prospects of future products), ID2 (My decision is based on the references of market conditions) and ID3 (My decision is based on the benchmark of investment performance). These three indicators are the ones that are most closely related to Financial Literacy, and they are all above the threshold of 4, specifically 4.296, 4.137, and 4.125 respectively. These scores suggest that respondents believe that their needs on Financial Literacy when they decide what they need to do to their investment, or, to put it another way, that respondents believe that Financial Literacy is affecting their Investment Decision.

Risk Perception positively affects the Investment Decision

The second hypothesis, which stated that a positive relationship exists between risk perception and investment decision, was confirmed by the analysis of the data. The reason for this is that the T-statistics are significantly higher than 1.96 when compared to the significance level of 0.05. Previous research by [26], [22], [23], [24], [30], and [25] investigated whether risk perceptions had a positive effect on investment decisions. This finding is consistent with those findings. [23] investigated whether risk perceptions had a positive effect on investment decisions.

The findings were also reflected in the questionnaire. All of the indicators that are related to Risk Perception have scores that are higher than 3.5. These indicators are ID4 (The rate of return on your recent stock investment meets your expectation), ID5 (I considered the statements of government officials about the company), and ID6 (I considered the past performance of the firm's stock before investing). The scores for these indicators are 3.758, 3.748, and 4.066 respectively. This demonstrates that respondents' perceptions of risk have an effect on their decisions regarding whether or not they will invest, or, to put it another way, their investment decisions.

V. CONCLUSION

The research aims to assess the effect of financial literacy and risk perception towards Gen-Z investment decisions around Greater Jakarta and Greater Bandung. The data was collected through the use of questionnaires that were directed to Gen-Z residents of Greater Jakarta and Greater Bandung who had invested in the previous calendar year. The analysis of the data included both descriptive analysis and a PLS analysis. The recommendations and implications for future research will be provided by the findings and the results of this research. The answer to the research question that was brought up in the prior

chapter can be found in the conclusion.

For the first research question, which is "Does financial literacy affect Gen-Z's investment decision?" After conducting the analytical test, it is possible to conclude that financial literacy influences Gen-Z investment decisions. According to the PLS analysis, financial literacy has a positive effect on investment decisions, which is consistent with the descriptive analysis. Some respondents look at the stock's previous performance, while others analyze how it relates to someone's financial literacy level. That is how Financial Literacy influences the investment decisions of Generation Z.

For the second research question, which is "Does risk perception affect Gen-Z's investment decision?" It was found through research and analysis that has already been done that risk perception is another factor that affects the investment decision made by Generation Z. It also fits in with the descriptive analysis, which found that respondents weigh the amount of risk involved in a potential investment before deciding where to put their money. That is how Risk Perception plays a role in the investment decisions made by Generation Z.

For the third research question, which is "What kind of investment that more preferred by financially literate and financially illiterate Gen-Z in Jabodetabek and Bandung?" According to the findings of the descriptive study, it was discovered that respondents who had a higher level of financial literacy had a greater likelihood of investing in gold and stocks. In the meantime, respondents with lower levels of financial literacy are more likely to invest on stocks, despite the fact that stocks are known as one of the most complicated investments compared to the other investments mentioned above.

Therefore, as a recommendation, this study has already identified a number of issues concerning financial literacy and investment decision-making among Indonesians, such as fraud and a lack of financial literacy. According to the results of this study's questionnaire, both the government and private financial institutions can help each other to encourage Indonesians to increase their financial literacy level, such as by organizing socialization and events that raise financial literacy awareness among Indonesians in order to avoid bad occurrences in the near future. However, This study only looks at financial literacy and risk perception in relation to investment decisions. There are several limitations to this study that should be addressed in future research, such as a larger sample size (all of Indonesia or different generations) that could yield different results and a better understanding of the investment situation. As a result, this study is only valid in Indonesia, and the limitations that have already been mentioned can be improved for future research.

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Paper 29

The Effect of Financial Literacy on Investment Vehicle of Choice: A Study on Investors Aged 17-39

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Abstract - Investment vehicles in Indonesia has grown vastly during the past few years. The number of young investors in Indonesia has grown significantly in the past years. In fact, majority of investors in Indonesia are millennials and gen z. Financial literacy is proven to be needed to make good financial decisions. However, the financial literacy level of younger generations of Indonesia still varies among the generations. This research will explore the level of financial literacy including its components financial knowledge, financial skills, and financial behavior among the millennials and generation z and their investment vehicle of choice. The research is a quantitative study and collects data through an online questionnaire on investors aged 17-39. For analysis technique, descriptive analysis and cross-tabulation is used. The results of this research shows that financial literacy level of millennials and gen z including financial knowledge, financial skills, and financial behavior does have an effect on investment vehicles of choice. Patterns in the results imply that samples with higher and lower financial literacy are more likely to prefer the stock market and bonds. On the other hand, millennials and gen z investors which has middle level of financial literacy more likely to prefer mutual funds.

Keywords - investment vehicle, financial behavior, financial knowledge, financial literacy, financial skills

I. INTRODUCTION

According to OJK Indonesia (Financial Services Authority) the number of SimPel/SimPel iB accounts in Indonesia in late 2018 has reached 17 million accounts, with a total nominal value of 6.64 trillion Rupiah. SimPel/SimPel iB itself is a program launched in 2015 for school students to start saving in student-exclusive bank accounts. As for college students, another program was launched in June 2019 called Simpanan Mahasiswa dan Pemuda (SiMuda). In just a month, 11,052 accounts were created with a total amount of 12.4 billion Rupiah. It is stated, that the potential number of college students that have savings would be around 8 million students and could have a total of 8 trillion Rupiah [1]. These numbers show how young people in Indonesia nowadays already have a certain amount of their own money and are starting to save money in banks. The surplus money they own has the potential to be invested to create a profit, but not everyone knows how to properly invest their money.

Through this digital era, awareness about investing money has become more common among millennials and Gen Z. People are learning more and more information from many platforms on the internet, including finance. Social media has become an especially important source of information, defying the interest in and resources available through conventional media (Amin et al, 2020) [2]. This vast information on many internet platforms is what attracts people, especially millennials and Gen Z to take an interest in the term "investment" and possibly in investing themselves. According to Indonesia's Central Security Depository (KSEI) the number of investors in the stock market has multiplied almost 3 times from 2018 to February 2021, and the number of investors in mutual funds has increased around 4 times from 2018 to February 2021. Other investments have also been shown to grow exponentially in the past few years. Of all those investors, 57.02% of them are below 30 years old and 22.01% of them are 31-40 years old [3].

With the growth of investors and the advanced technology of the modern world, the number of platforms for investment has also increased significantly. Several new applications are very easy for beginners to start investing in. Mutual fund applications only need an identity card and a bank account to start investing. The easy access to investing also encourages the generations to at least try investing, even with or without previous knowledge about investing. Indonesia's Ministry of Investment (n.d.) stated that the Indonesia Investment Coordinating Board, or BKPM, has come up with a new way to ease foreign and domestic investors' investment today. The National Single Window for Investment (NSWI) is an online investment system that links various government agencies' databases in issuing licenses needed to invest. This online investment system was designed to reduce the time needed by investors to make direct investments. Investors no longer need to visit each government agency's office to obtain all the necessary permits. It is a gateway to a paperless and convenient investment system [4]. The applications and other platforms vary in investment products, giving investors the freedom to choose from many different investment vehicles.

Despite the choices, Lukas Setia Atmaja, Monetary and Investment Academic at the Capital Market Summit and Expo 2019, stated that 85% to 90% of investors failed to invest in the capital market. He added that many investors don't have the required skills and knowledge for investing

in the capital market, and some are trapped by the technical data of stocks [5]. The loss of a large amount of money can have a traumatic effect on individuals, particularly if that loss impacts important life milestones, such as retirement, paying for a child's education, or the purchase of a home. Many individuals may feel that there is no coming back from the financial loss and therefore take actions that exacerbate the situation (Bloch, 2021) [6].

For that reason, to choose from available investment vehicles, many things need to be put into consideration by an individual. Hemalatha (2019) concluded that there are many factors that directly or indirectly influence individual investment decisions. The factors chosen for their analysis are capital appreciation, tax benefit, expected return, liquidity, risk minimization, and financial security. It is assumed that the investors have a high enough financial literacy level to comprehend each of those factors [7]. Despite this, many investors in Indonesia are beginners and might have a low level of financial literacy. This research aims to understand how these millennials and Gen Z in Indonesia, specifically in Jabodetabek, make their decisions on investment vehicles according to their level of financial literacy. Financial literacy itself consists of a few things, including financial knowledge, financial skills, and financial behaviors, which will be the focus of this study.

Some investments are riskier than others, and some are a lot safer. These risks can be taken by a person according to their risk tolerance level. People, who don't have a good idea, should start with low-risk investments such as keeping money in a savings bank account and making deposits in a bank for a short-term period with fixed interest rates (Prasad, 2013) [8]. Individuals with high risk-taking and high risky investment intentions tend to move toward stocks and derivatives; people with low risk-taking and low risky investment intentions are expected to prefer bonds and bank deposits (Aren and Hatice, 2020) [9]. Kumar and Kumar (2020) also stated, that a risk-averse person would prefer investing in fixed deposits, bonds, etc., as they involve less risk, whereas a risk-lover would prefer investing his money in stocks as they have the potential to give higher returns than fixed deposits [10]. Risk management requires a prudent balancing of risk and return. Assessing this balance, based on individual needs, should be the main concern when building a portfolio (Jacobs, 2020) [11].

Risky investment preferences of individuals with both general risks perceiving and emotional intelligence were found to have important relationships. They found that emotional intelligence had a positive effect on financial risk-taking and general risk aversion (not financial) had a negative effect (Aren and Hatice, 2020) [9]. This leads

to how financial literacy may influence the decision; how well a person understands investment vehicles and the risks they entail; and how confident or ignorant they are in taking the risk. Thus, knowing the effect of financial literacy in choosing an investment vehicle might help millennials and Gen Z when entering the investment world and choosing how they want to invest.

II. METHODOLOGY

A. Data Collection

a. Research Approach

The research will study the relationship between variables, so it will utilize a quantitative approach. Casebeer and Verhoef (1997) stated that quantitative research is defined as "the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect," [12]. Fabozzi et al. (2005) also said the quantitative process is capable of systematically handling a large amount of information quickly and consistently, and ambiguity and unpredictability, which are often associated with subjective choices during decision making, can be kept to a minimum [13]. Which makes the quantitative approach suitable for this research.

b. Survey Method

The survey will reach the respondents that are within the limitations through an online questionnaire survey method using Google forms and will be shared on social platforms. The questionnaire will adopt the Likert scale with measurement points of 1 to 5 in measuring the variables in the research. Babakus and Mangold (1992) stated a 5-point Likert-type scale was used to increase response rate and response quality along with reducing respondents' "frustration level" (Collier and Bienstock, 2006) [14]. The points will be scaled from 1, which is for strongly disagreeing, to 5, for strongly agreeing with the statements in the questionnaire.

c. Questionnaire Design

The questionnaire has 3 sections. The first section of the questionnaire is about the demographics or identity of the respondents. The next section collects data around the independent variable, which is financial literacy, and the last section will be about the chosen investment vehicles. The questionnaire items from section 2 consist of financial knowledge, skills, and behavior. The global organization OECD (Organization for Economic Co-operation and Development) describes the assessment of financial literacy as being based on three aspects, which are content, processes, and context. Content is

the knowledge or understanding of the key elements. Processes are the mental strategies or skills to accomplish the tasks, and context is the general information about the subject [15]. The topics included in content and processes will be used to design knowledge and skills questions (4 topics each). Knowledge or content topics are money and transactions, financial planning and management, risk and return, financial landscape. Skills or processes topics are identifying financial information, analyzing the information in a financial context, evaluating the financial issues, applying known and understood financial concept.

Questions regarding financial behavior will be adapted from Alex Yue (2021) about six healthy financial behaviors: saving regularly, tracking monthly expenses, spending within a budget, keeping an adequate balance in their bank account, saving for an emergency, and saving for the future [16]. Due to the relationship with investment, risk profile and resiliency topics will also be added to the financial behavior topic. The third section consists of simple items regarding their preference for investment vehicles.

d. Population and Sample

The target respondents of this research are millennials and Gen Z who have invested in an investment vehicle previously. The research will use purposive sampling to reach the specific respondents. Roscoe (1969) proposed a rule of thumb to follow when determining sample size, which is that the number of participants in a questionnaire should be greater than 30 and less than 500. The sample size should be at least ten times or more as large as the number of variables in the study [17]. As a result, this research will take 10 times 4 (variables), or at least 40 samples from the total population. To increase the precision and reducing uncertainty, this research will aim to collect 70 responds as a sample.

B. Data Analysis

This research will be using primary data from an online questionnaire survey. Therefore, the data will be tested for its reliability and validity to be used in this research. When the data collected has been proven valid and reliable, descriptive analysis will be used to find out the level of financial literacy of the respondents and their choice of investment instrument. To perceive the effect of the independent variables on the dependent variable, each level of the financial knowledge, skills, behavior, and literacy as a whole will be matched with the tendency of their investment vehicle of choice. This method is also known as the cross-tabulation method, contingency table, or cross tabs. A method common in statistical analysis to find patterns, trends, and probabilities within raw data. Cross-tabulation is a method to quantitatively analyze the

relationship between multiple variables. Cross-tabulation groups variables to understand the correlation between different variables. It also shows how correlations change from one variable grouping to another.

III. RESULTS

This research aims to know the effect of financial literacy on the investment vehicle of choice for millennial and gen z investors. Financial literacy consists of financial knowledge, financial skills, and financial behavior. The choices of investment vehicles are the stock market, bonds, and mutual funds. This research will be using cross-tabulation analysis to quantitatively analyze the relationship between multiple variables.

A. Investment Vehicle Choices Based on Financial Knowledge Level

The respondents' level of financial knowledge obtained from the descriptive analysis will be used in cross-tabulation analysis with the investment vehicles of choice.

The cross-tabulation table between the investment vehicle most frequently used and the financial knowledge level of the respondents is as follows:

Table 1 - Investment Vehicle Choices Based on Financial Knowledge

Financial Knowledge			Stock Market		Bonds		Mutual Funds	
Level	n	%	n	%	n	%	n	%
Poor	0	0%	0	0%	0	0%	0	0%
Fair	2	3%	1	50%	1	50%	0	0%
Good	6	8%	1	17%	0	0%	5	83%
Very Good	50	68%	24	48%	5	10%	21	42%
Excellent	15	21%	7	47%	3	20%	5	33%

From the table above, the combination most likely to occur is the respondents use the stock market and have very good financial knowledge (24 respondents). The data above can also be presented in a form of a bar chart as below:

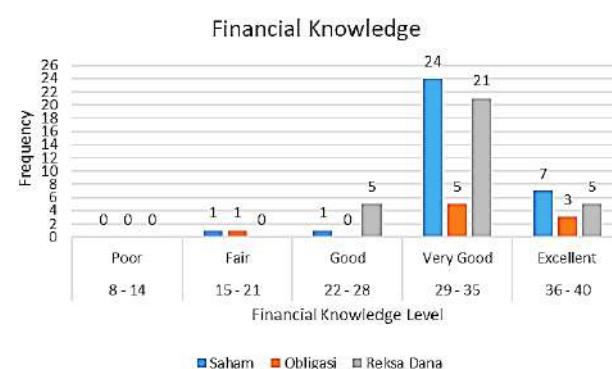


Fig. 1. Bar Graphs of Financial Knowledge Results

From the graph above, it can be obtained results such as:

- There is no respondent with poor financial knowledge from the respondents.
- Respondents with fair financial knowledge, 1 use stock market ,1 use bonds, and none use mutual funds as their investment vehicle.
- Respondents with good financial knowledge, 1 use stock market, none use bonds, and 5 use mutual funds as their investment vehicle.
- Respondents with very good financial knowledge, 24 use stock market, 5 use bonds, and 21 use mutual funds as their investment vehicle.
- Respondents with excellent financial knowledge, 7 use stock market, 3 use bonds, and 5 use mutual funds as their investment vehicle.

B. Investment Vehicle Choices Based on Financial Skills Level

The respondents' level of financial skills obtained from the descriptive analysis will be used in cross-tabulation analysis with the investment vehicles of choice.

The cross-tabulation table between the investment vehicle most frequently used and the financial skills level of the respondents is as follows:

Table 2 - Investment Vehicle Choices Based on Financial Skills

Financial Skills			Stock Market		Bonds		Mutual Funds	
Level	n	%	n	%	n	%	n	%
Poor	1	1%	0	0%	0	0%	1	100%
Fair	11	15%	7	64%	2	18%	2	18%
Good	25	34%	9	36%	1	4%	15	60%
Very Good	27	37%	12	44%	3	11%	12	44%
Excellent	9	12%	5	56%	3	33%	1	11%

From the table above, the combination most likely to occur is the respondents most used mutual funds and have good financial skills (15 respondents). The data above can also be presented in a form of a bar chart as below:

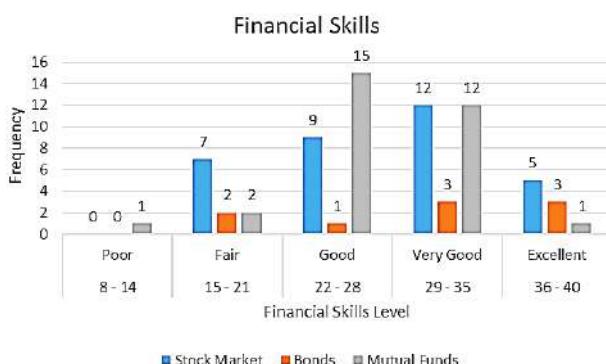


Fig. 2. Bar Graphs of Financial Skills Results

From the graph above, it can be obtained results such as:

- Respondent with poor financial skills use mutual funds as their investment vehicle.
- Respondents with fair financial skills, 7 use stock market ,2 use bonds, and 2 use mutual funds as their investment vehicle.
- Respondents with good financial skills, 9 use stock market, 1 use bonds, and 15 use mutual funds as their investment vehicle.
- Respondents with very good financial skills, 12 use stock market, 3 use bonds, and 12 use mutual funds as their investment vehicle.
- Respondents with excellent financial skills, 5 use stock market, 3 use bonds, and 1 use mutual funds as their investment vehicle.

C. Investment Vehicle Choices Based on Financial Behavior Level

The respondents' level of financial behavior obtained from the descriptive analysis will be used in cross-tabulation analysis with the investment vehicles of choice. The cross-tabulation table between the investment vehicle most frequently used and the financial behavior level of the respondents is as follows:

Table 3 - Investment Vehicle Choices Based on Financial Behavior

Financial Behavior			Stock Market		Bonds		Mutual Funds	
Level	n	%	n	%	n	%	n	%
Poor	0	0%	0	0%	0	0%	0	0%
Fair	1	1%	1	100%	0	0%	0	0%
Good	11	15%	3	27%	2	18%	6	55%
Very Good	41	56%	21	51%	3	7%	17	41%
Excellent	20	27%	8	40%	4	20%	8	40%

From the table above, the combination most likely to occur is the respondents most used the stock market and have very good financial behavior (21 respondents). The data above can also be presented in a form of a bar chart as below:

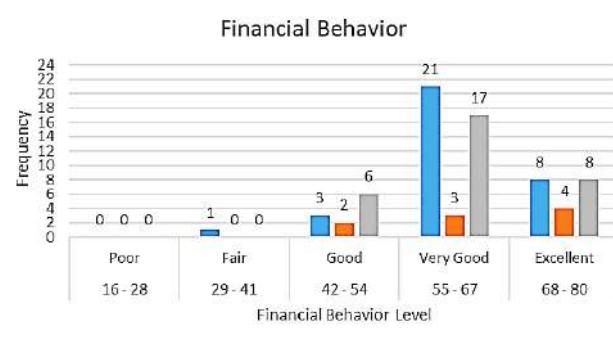


Fig. 3. Bar Graphs of Financial Behavior Results

From the graph above, it can be obtained results such as:

- There is no respondent with poor financial behavior from the respondents.
- Respondent with fair financial behavior uses stock market as their investment vehicle.
- Respondents with good financial behavior, 3 use stock market, 2 use bonds, and 6 use mutual funds as their investment vehicle.
- Respondents with very good financial behavior, 21 use stock market, 3 use bonds, and 17 use mutual funds as their investment vehicle.
- Respondents with excellent financial behavior, 8 use stock market, 4 use bonds, and 8 use mutual funds as their investment vehicle.

D. Investment Vehicle Choices Based on Financial Literacy Level

The respondents' level of financial literacy obtained from the descriptive analysis will be used in cross-tabulation analysis with the investment vehicles of choice.

The cross-tabulation table between the investment vehicle most frequently used and the financial literacy level of the respondents is as follows:

Table 4 - Investment Vehicle Choices Based on Financial Literacy

Financial Literacy		Stock Market		Bonds		Mutual Funds		
Level	n	%	n	%	n	%	n	%
Poor	0	0%	0	0%	0	0%	0	0%
Fair	1	1%	1	100%	0	0%	0	0%
Good	11	15%	5	45%	1	9%	5	45%
Very Good	47	64%	20	43%	5	11%	22	47%
Excellent	14	19%	7	50%	3	21%	4	29%

From the table above, the combination most likely to occur is the respondents most used mutual funds and regularly very good financial literacy (22 respondents). The data above can also be presented in a form of a bar chart as below:

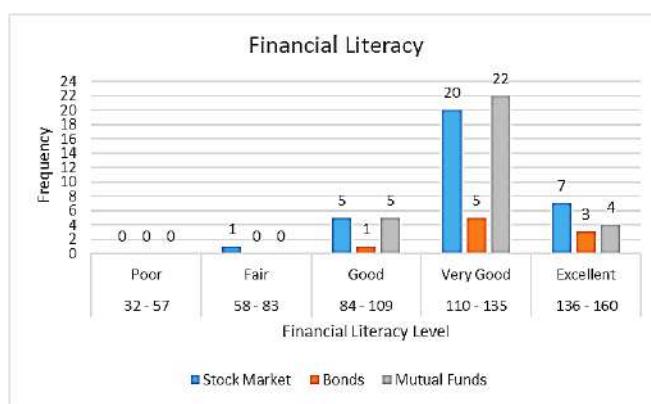


Fig. 4. Bar Graphs of Financial Literacy Level

From the graph above, it can be obtained results such as:

- There is no respondent with poor financial literacy from the respondents.
- Respondent with fair financial literacy use stock market as their investment vehicle.
- Respondents with good financial literacy, 5 use stock market, 1 use bonds, and 5 use mutual funds as their investment vehicle.
- Respondents with very good financial literacy, 20 use stock market, 5 use bonds, and 22 use mutual funds as their investment vehicle.
- Respondents with excellent financial literacy, 7 use stock market, 3 use bonds, and 4 use mutual funds as their investment vehicle.

IV. DISCUSSION

The title of this research is "The effect of financial literacy on investment vehicle of choice: a study on the millennial generation and gen z with investing experience." The results of the data processing have shown the differences in investment vehicle of choice in each financial literacy level including financial knowledge, financial skills, and financial behavior levels. The results of the research can be further discussed as follow:

A. Financial Knowledge effect on Investment Vehicle of Choice

The first hypothesis is that financial knowledge has an effect on the investment vehicle of choice. From the answers to the questionnaire and the results presented, even though there are no respondents with poor financial knowledge and unbalanced frequencies of each level, the differences in chosen investment vehicle of each financial knowledge level are shown in the charts.

Respondents with fair financial knowledge 1 used stock market and 1 use bonds as their most preferred investment vehicle, meaning none of them preferred to use mutual funds. However, none of the respondents with good financial knowledge prefer bonds and only 1 of them use the stock market the most, and most of the them, 5 respondents, prefer to use mutual funds. While the 24 of respondents with a very good financial knowledge level prefer mutual stock market, 21 prefer mutual funds, 5 prefer bonds, meaning most of them prefer stock market followed closely by mutual funds. Favorite investment vehicle among respondents with excellent financial knowledge is stock market with 7 respondents, 5 prefer mutual funds, and 3 prefer to use bonds.

B. Financial Skills effect on Investment Vehicle of Choice

The second hypothesis is that financial skills have an effect on investment vehicle of choice. Even though there is only one with poor financial skills and unbalanced frequencies of each level, it was shown in the results and the graph the differences among respondents with different financial skills in choosing their investment vehicle.

The only respondent with poor financial skills prefer mutual funds as their investment vehicle. Respondents with fair financial skills, the highest is 7 which used stock market, 2 use bonds and 2 use mutual funds as their most preferred investment vehicle. However, 15 of the respondents with good financial skills prefer mutual funds, 9 of them use the stock market the most, and only 1 of them prefer bonds. Equally, 12 of respondents with a very good financial skills level prefer mutual funds and 12 of them prefer stock market, but only 3 prefer bonds. Favorite investment vehicle among respondents with excellent financial skills is stock market with 5 respondents, 3 prefer bonds, and only 1 prefer to use mutual funds.

C. Financial Behavior effect on Investment Vehicle of Choice

The third hypothesis is that financial behavior has an effect on the investment vehicle of choice. Even though there are no respondents with poor financial behavior and only 1 with fair financial behavior, each level of financial behavior has shown different investment vehicle preferences.

The only respondent with fair financial behavior prefer stock market as their investment vehicle. There are 6 of the respondents with good financial behavior prefer mutual funds, 3 of them use the stock market the most, and only 2 of them prefer bonds. Majority of respondents with a very good financial behavior level, 21 of them prefer stock market, 17 of them prefer mutual funds, but only 3 prefer bonds. Favorite investment vehicle among respondents with excellent financial behavior is both stock market and mutual funds with 8 respondents each, and only 4 of them prefer bonds.

D. Financial Literacy effect on Investment Vehicle of Choice

The fourth hypothesis is that financial literacy has an effect on investment vehicle of choice. Financial literacy is obtained by combining all three financial knowledge, financial skills, and financial behavior. As a result, there are no respondents with poor financial literacy and there is only one respondent with a fair financial literacy level.

The only respondent with fair financial literacy prefer stock market as their investment vehicle. There are 5 of

the respondents with good financial literacy prefer mutual funds, also 5 of them use the stock market the most, and only 1 of them prefer bonds. Majority of respondents with a very good financial literacy level, 22 of them prefer mutual funds, 20 of them prefer stock market, but only 5 prefer bonds. Favorite investment vehicle among respondents with excellent financial literacy is stock market with 7 respondents, 4 prefer to use mutual funds, and 3 prefer to use bonds.

V. CONCLUSION

A. Conclusion

Building upon the analysis results and the discussion, a conclusion could be made from the study on millennial and gen z about the effect of financial literacy on investment vehicle of choice such as follow:

1. Most of the samples perceive themselves to have very good financial knowledge, none have the poor financial knowledge and only two have fair financial knowledge. There are differences in investment vehicle preferences at each level. Even though bond users overall are the lowest, both bonds and the stock market are more likely to be used in the lowest and the two highest levels. Meaning they are the lowest in the middle or good level, which most of the respondents prefer to use mutual funds. Vice versa, mutual funds users are less likely the lower or the higher their financial knowledge level is.
2. Most of the samples perceive themselves to have very good financial skills, only one has poor financial skills. There are differences in investment vehicle preferences at each level. While bonds users overall are the lowest, it is the lowest in the poor and good level. The stock market is more likely to be used in fair, very good, and excellent level. Meaning they are the lowest in the middle or good level and also the poor level which only has one respondent. In the good level and also very good level, most of the respondents prefer to use mutual funds. Mutual funds users are less likely to be used in the fair and excellent level.
3. Most of the samples perceive themselves to have very good financial behavior, none have poor financial behavior and only one has fair financial behavior which prefers stock market. There are differences in investment vehicle preferences at good, very good, and excellent levels. Mutual funds are most likely to be used in good and excellent levels of financial behavior. The stock market is more likely at the very good and also excellent level, and bonds are more likely to be used at the excellent level than other levels.

4. Most of the samples perceive themselves to have very good financial literacy, none have poor financial literacy and only one has fair financial literacy which prefers stock market. There are differences and patterns in investment vehicle preferences at good, very good, and excellent levels. In the good level, both stock market and mutual funds are as likely to be used and bonds are the lowest. Mutual funds are the most likely to be used in the very good level and stock market is the most likely to be used in excellent level. For bonds, it is more likely to be used in the higher levels.

B. Suggestion

Based on the results, discussion, and conclusion of this study, the writer gives some suggestion for the better of millennials and gen z in investing as follow:

1. For investment vehicle providers, as the riskier investment, stock market providers should give warning and more education on financial literacy to their users since there are some users with lower financial literacy. Bonds providers such as the government should try to reach out more to the lower level of financial literacy since it has the lowest risk. Mutual funds should reach out more to lower and higher levels of financial literacy, with a variety of risks and rewards, mutual funds should be able to attract lower and higher levels of financial literacy.
2. For millennials and gen z investors, the higher number of stock market users in lower and middle financial literacy is concerning since it is riskier and information gathering is needed. Users of bonds are very low in number and bonds could be a great diversion of risk in investing.
3. For the next researchers, it is recommended to research deeper into the study such as specific to any investment vehicle. There are also a lot of other variables and factors that could lead to different investment vehicles that could be researched.

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Paper 30

The Effects of Financial Literacy, Peer Influence and Self-Control on Saving Behavior of Young Adults in West Java

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - In the phenomenon of unstable and unpredictable economy, saving is really needed since it can help to cover up the unexpected income loss. Saving can also help to protect the nation from economic downturn and financial crisis. This kind of unpredictable financial situation could happen and faced by the younger generation in the future. Conducting research that discussed about saving behavior of young adults is important since young adults are going to be the backbone of the future economy. Therefore, this research aims to examine the relationships between several determinants on saving behavior of young adults in West Java. The survey data that consists of 294 respondents was processed using Multiple Linear Regression with SPSS tools. The findings show that financial literacy does not have a significant relationship with saving behavior while peer influence and self-control have positive significant relationship with saving behavior of young adults in West Java.

Keywords – Financial Literacy, Peer Influence, Saving Behavior, Self-Control, Young Adults

I. INTRODUCTION

A. Background

Saving plays an important role not only for individuals but also for nation. For individuals, saving can help to fulfil the planned expenditure and cover the unexpected expense [1]. For nation, saving plays an important role in economic growth and development [2]. This is in line with some research projects which state that high savings can lead to higher investment and then stimulate economic growth [3] [4].

The result of a survey [5] stated that the financial (economy) aspects are the effects of pandemic that have the most impact on society (60.3% respondents answer reduced income, 16.1% respondents answer the loss of job). In this phenomenon of unstable and unpredictable economy, saving is really needed to cover up the unexpected income loss which is hoped to help reduce the negative impacts. As stated in research [6], high saving can help to protect the nation from economic downturn and financial crisis.

However, there is a paradox of thrift in the economics. Paradox of thrift is an economic theory that stated an

increase in autonomous saving can leads to a decrease in aggregate demand. This will lead to a decrease in gross output that in turn will decrease total saving [7]. The paradox can be seen when every individual rises their saving, the company's revenue will decrease as the demand decrease. This will lead to the decrease of employee's income hence decrease the total saving of population. Therefore, it must be kept in mind that individual saving needs to be in a good proportion with spending, especially in the short run or during difficult time. This leads to the importance of individuals to save in a habitual manner (little by little) rather than bulk saving in the crisis time, so that they can use their saving (do spending) in difficult time.

From the research [8], it is found that in the recent years, Indonesia savings rate has decreased continuously from 31.68% in 2018 to 30.9% in 2019 and 29.61% in 2020. Considering the importance of saving and the decrease of savings rate, the study of saving behavior is needed.

There are several determinants of saving behavior that has been analyzed in previous research projects. One of the determinants is financial literacy. The research [9] stated that financial literacy positively impacted saving behavior. To increase the savings rate, it is important to increase the financial literacy through various education programs [6]. Based on the survey by financial services authority [10] [11], financial literacy index in Indonesia has increased from 29.7% in 2016 to 38.03% in 2019. However, in West Java, the province with the largest population in Indonesia, with currently 48,274,162 people [12], the financial literacy index has decreased from 38.70% in 2016 to 37.43% in 2019. West Java also has the lowest financial literacy index among other provinces in the Java-Bali islands. This finding makes West Java interesting to be studied on.

Other than financial literacy, peer influence and self-control also considered as determinants of saving behavior. One of the research projects indicated that peer influence has effect on individual saving behavior [13]. The other project indicated that self-control has impact on saving behavior [14]. There is another research project that discussed the similar topic about this. With a sample of 167 university students from various universities in Indonesia, the result shows that reference group and self-control have a significant effect on saving behavior [15].

Conducting research that discussed about saving behavior

of young adults, especially in Indonesia, is really important since young adults are going to be the backbone of the future economy in Indonesia. State-owned Enterprises (SOE) Minister Erick Thohir stated in one of his public lectures that the younger generation is the backbone of Indonesia ecosystem development and progress [16]. Other than that, there is a survey conducted by Standard Chartered that stated the millennial generation aged 25-44 years was the most affected generation by the pandemic on the financial side [17]. This kind of unpredictable financial situation could happen and faced by the younger generation in the future. It indicates that they need to have the sufficient knowledge and ability about managing their finance to anticipate and deal with this, one of them is about saving.

Recent research related to saving behavior are mainly focused on household [18] [19]. This is similar with the recent studies in Indonesia where the studies mainly focused on saving of household, students, or some specific occupation in one area [20] [21]. There is a lack of research about saving of young adults.

The importance of saving and the lack of research about saving on young adults, especially in Indonesia, makes the researcher interested in conducting a study on this topic. This research aims to investigate the financial literacy, peer influence, and self-control of young adults in West Java along with each variable relationships with saving behavior.

B. Literature Review

1. Financial Literacy

Financial literacy has various conceptual definitions. From those definitions, there are five-groups categorization based on various research studies since 2000 [22]. The categories are: (1) knowledge of financial concept, (2) the ability to communicate financial concept, (3) personal finance management ability, (4) skill in making financial decisions, and (5) effective financial planning confidence. These are the common definitions of financial literacy according to various experts. There is a similar review from various literatures and made a four-groups categorization that are the same with category (1), (3), (4) and (5) from previous review [23]. There is no consistent conceptual definition of financial literacy.

The various of financial literacy definitions give rise to various measurement instruments. There is no standardized instrument in measuring financial literacy. Researchers try to make their own ways to assess or measure financial literacy. The common instrument used is test score that mainly assess the knowledge of the respondents. One of the most popular tests is the three

questions developed by Lusardi and Mitchell [24]. The questions are about compound interest, inflation, and risk diversification. There is also another test about financial literacy, such as the questionnaire developed by OECD that split financial literacy into three dimensions: (1) financial behavior, (2) financial knowledge, and (3) financial attitude [25]. Another questionnaire is designed by van Rooij, Lusardi, and Alessie which consists of two parts: basic and advanced literacy, with 16 questions in total [26].

Financial literacy is an important part of a successful adult life, as it shapes not only the attitude towards financial management practices, but also the attitude towards general life [27]. Based on the analysis of cross-country data, it is found that financial literacy has a strong effect on national saving [28]. To increase the savings rate, it is important to increase the financial literacy through various education programs [6] [29].

2. Peer Influence

Peer influence is the extent to which peers influence an individual's attitudes, thoughts, and actions [30]. Another researcher defined peer influence as phenomenon characterized by the presence of selection and socialization [31]. Peer saving decision can influence saving decision of someone [32].

3. Self-Control

Self-control is defined as the ability to set aside or change inner responses, interrupt undesired behavioral tendencies (such as impulses) and refrain from acting on them [33]. Self-control is related to saving behavior [34]. Thus, self-control is an important skill for the young.

4. Saving Behavior

Saving, in economic context, is defined as a residual between income and current consumption [35]. Saving is useful for emergencies, future used, and retirement [36]. Other than the individual needs, saving is also importance for nation since saving provides a source of investment fund to develop the economy of a nation.

5. Financial Literacy and Saving Behavior

Based on the research conducted in Malaysia, it is stated that financial literacy had a positive significant effect on savings behavior of college students which indicates that financial literacy is connected to better savings behavior [37]. The similar result is also found in research conducted in Vietnam [38]. It is stated that financial literacy has a positive effect on personal saving behavior.

6. Peer Influence and Saving Behavior

According to the result of a research conducted in Kota Kinabalu, Sabah, Malaysia, peer have a positive and significant influence in shaping the young [39]. The similar result also found in research conducted in Tamil Nadu and Puducherry, India. It is stated that savings behavior and the peer inspiration are related with one another [40].

7. Self-Control and Saving Behavior

Research conducted in one of the public high schools in Lamongan, Indonesia, it is found that self-control partially and simultaneously influence the saving behavior [41]. The similar result also found in research conducted in Jakarta, Indonesia, that stated self-control has a positive relationship toward saving behavior [42].

C. Conceptual Framework

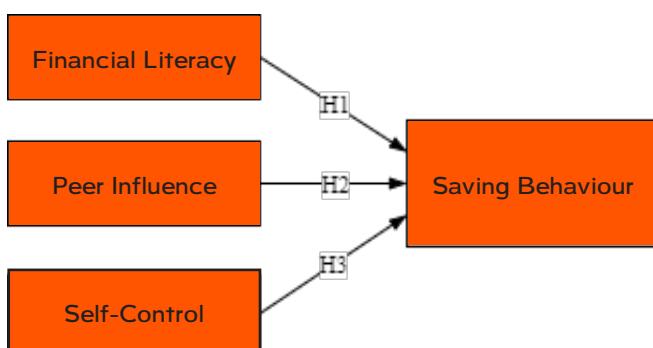


Fig. 1. Conceptual Framework

H1: Financial literacy is positively related toward saving behavior.

H2: Peer influence is positively related toward saving behavior.

H3: Self-control is positively related toward saving behavior.

II. METHODOLOGY

This research is explanatory research with a quantitative approach. The target respondents for this research are young adults, ages ranging from 17-25 years old, from West Java, Indonesia. Young adults generally defined as persons aged 18 to 25 years old [43]. The researcher decided to also include 17-year-old into this category since in Indonesia, people in this age are already considered as an adult and have their own identity card. West Java consists of 9 cities (Bandung, Banjar, Bekasi, Bogor, Cimahi, Cirebon, Depok, Sukabumi, Tasikmalaya) and 18 regencies (Bandung, Bandung Barat, Bekasi, Bogor, Ciamis, Cianjur, Cirebon, Garut, Indramayu, Karawang, Kuningan, Majalengka, Pangandaran, Purwakarta, Subang, Sukabumi, Sumedang, Tasikmalaya).

Due to the limited time and resources, coupled with the difficulty of getting respondents who are willing to answer and meet the criteria, the researcher decided to take 300 samples. This number is exceeding the minimum size of respondents according to Cattell, which stated that minimum size of 250 respondents is recommended for research with three to six independent variables [44]. The sampling technique that the researcher use is simple random sampling. This technique is chosen because the researcher does not have any specific criteria or requirement to choose respondents from the population.

The questionnaire will be delivered through Google Form. The questionnaire will be divided into five parts. The first part is to gain general information about the respondents. The second part is to measure the financial literacy of the respondents. The researcher decided to use quiz-like questions to assess the financial literacy rather than using the five-point Likert-scale questions. In this part, the questionnaire was adapted from Amari, Salhi, and Jarboui that consists of 10 questions [45]. This part will be measured by the number of correct answers. The third, fourth, and fifth part are about peer influence, self-control, and saving behavior of the respondents. In these parts, the questionnaires were adapted from Thung et al [46]. The number of questions for each part is: 5 questions for peer influence, 10 questions for self-control, and 8 questions for saving behavior. For part three until five, they will be measured via five-point Likert-scale ranging from strongly disagree (1) to strongly agree (5).

The data collected from respondents will be analyzed using SPSS software version 26. There will be several steps in analyzing the data. The first step is descriptive analysis, followed by validity and reliability analysis, classical assumption tests (normality, multicollinearity, heteroscedasticity), and the last step is multiple linear regression.

III. RESULTS

A. Demographic Profile

A total of 300 responses were collected and processed through the data cleaning which resulted in 294 responses to be used in this research. The first section of the questionnaire has some questions design to get a demographic profile of the respondents, such as gender, age, occupation, and domicile.

1. Gender

Table 1 - RESPONDENT'S GENDER

Gender	Frequency	Percentage (%)
Male	116	39.5
Female	178	60.5
Total	294	100

The majority of the respondents are female with 60.5% or 178 respondents while male takes 39.5% or 116 respondents from the total 294 respondents.

2. Age

Table 2 - RESPONDENT'S AGE

Age	Frequency	Percentage (%)	21	70	23.8
17	2	0.7	22	82	27.9
18	13	4.4	23	33	11.2
19	12	4.1	24	18	6.1
20	48	16.3	25	16	5.4
			Total	294	100

Most of the respondents are in the age of 22 with 27.9% (82 respondents), followed by the age of 21 with 23.8% (70 respondents) 20 with 16.3% (48 respondents) 23 with 11.2% (33 respondents) 24 with 6.1% (18 respondents).

3. Occupation

Table 3 - RESPONDENT'S OCCUPATION

Occupation	Frequency	Percentage (%)
Student	10	3.4
College Student	213	72.4
Working	70	23.8
Fresh Graduate	1	0.3
Total	294	100

Most of the respondents are college students with 72.4% or 213 respondents, followed by working with 23.8% or 70 respondents, students with 3.4% or 10 respondents. One other respondent fills the 'others' option with fresh graduate (no longer a college student, but also not working yet) which takes 0.3%.

4. Domicile

Table 4 - RESPONDENT'S DOMICILE

Domicile	Frequency	Percentage (%)
Regencies		
Bandung	9	3.1
Bandung Barat	11	3.7
Bekasi	8	2.7
Bogor	11	3.7
Ciamis	3	1.0
Cianjur	3	1.0
Cirebon	4	1.4
Garut	2	0.7
Indramayu	3	1.0
Karawang	6	2.0
Kuningan	5	1.7
Majalengka	4	1.4
Pangandaran	5	1.7
Cities		
Purwakarta	5	1.7
Subang	4	1.4
Sukabumi	5	1.7
Sumedang	5	1.7
Tasikmalaya	4	1.4
Total	294	100

The domicile falls into 27 options. The majority of the respondents are come from Bandung City with the percentage of 25.9% (76 respondents) followed by Bekasi City with 11.9% (35 respondents) and Depok City with 7.5% (22 respondents). The rest are below 6% for each domicile.

B. Descriptive Analysis

Table 5 - DESCRIPTIVE STATISTICS

	N	Range	Minimum	Maximum	Mean	Std. Deviation
FL	294	8	2	10	6.87	2.031
PI	294	16	9	25	18.21	3.264
SC	294	39	11	50	35.94	9.194
SB	294	18	22	40	33.54	3.913
Valid N (listwise)	294					

From the table, it is found that the average score of Financial Literacy (FL) is 6.87 from the scale of 10. From the range (8), it can be seen that the score is spread from those who have low financial literacy (2) to those who have high financial literacy (10).

For Peer Influence (PI), the average score is 18.21 from the scale 25. From the range (16), it can be seen that the score is spread from those who are not highly influenced by their peers (9) to those who highly influenced by their peers (25).

For Self-Control (SC) the average score is 35.94 from the scale 50. From the range (39), it can be seen that the score is spread from those who have greater impulsivity or lower self-control (11) to those who have higher self-control (50).

For Saving Behavior (SB), the average score is 33.54 from the scale 40. From the range (18), it can be seen that the score is spread from those who does not practice effective saving behavior (22) to those who practice effective saving behavior (40).

C. Validity Reliability

1. Validity

The statements in the questionnaire can be acknowledged valid if the value of Sig. is less than 0.05 [47]. All the sig. (2-tailed) value in every variables are below 0.05 which means that all the questions are valid.

2. Reliability

The minimum Cronbach's Alpha is 0.60 [48]. The Cronbach's Alpha for Financial Literacy, Peer Influence, Self-Control, and Saving Behavior respectively: 0.605; 0.619; 0.933; 0.759. All the alpha of each variable are exceeding the minimum value which means that the questionnaire is reliable.

D. Classical Assumption

1. Normality

One-Sample Kolmogorov Smirnov Test is used to check the normality. To pass the assumption, the value of the exact sig. (2-tailed) must be above 0.05 [49]. The value is 0.311 which means that the data is normally distributed and pass the criteria.

2. Multicollinearity

To pass the assumption, the value of the tolerance must be greater than 0.1 and the value of the VIF (Variance Inflation Factor) must be lower than 10 [50]. The value of the tolerance of Financial Literacy, Peer Influence, Self-Control respectively: 0.745; 0.894; 0.729. The value of the VIF of Financial Literacy, Peer Influence, Self-Control respectively: 1.342; 1.119; 1.371. All the value of both tolerance and VIF are pass the criteria, so multicollinearity does not occur in this data.

3. Heteroscedasticity

To pass the assumption, the value of the sig. (2-tailed) must be above 0.05 [51]. The value of the sig. (2-tailed) of Financial Literacy, Peer Influence, Self-Control respectively: 0.996; 0.823; 0.321. All the sig. values are above 0.05 which means they pass the criteria and there is no heteroscedasticity occur in the data.

E. Multiple Linear Regression

1. Coefficient of Determination

The coefficient of determination is the result of regression analysis that indicates the ratio of the dependent variable explained by the independent variables. There are three levels of R square [52]. First, if R square is greater than 0.26, it is considered substantial. Second, if the R square is in between 0.13 and 0.25, it is considered moderate. Third, if the R square is in between 0.02 and 0.12 or less, it is considered weak.

The R square of this model is 0.271 which means that all independent variables (financial literacy, peer influence, self-control) can explain 27.1% saving behavior as the dependent variable. The remaining 72.9% is affected by factors other than these independent variables. This model equation is considered as substantial level since the value of R square is greater than 0.26.

2. F-Test

This test conducted to find out if the model equation is significant. The F-value of this model is 35.986 and the sig. value less than 0.05. This signifies that the overall

regression model with these three independent variables simultaneously can explain the dependent variable (SB) well [53].

3. P-value

The significance of each independent variables can be seen from the p-value. If the p-value is below 0.05, it means that the independent variables have a significant relationship with the dependent variable [54].

- o Financial Literacy (FL) has a p-value of 0.592. Because the p-value is greater than 0.05, it means that Financial Literacy does not have a significant relationship with Saving Behavior (SB).
- o Peer Influence (PI) has a p-value of 0.000. Because the p-value is lower than 0.05, it means that Peer Influence has a significant relationship with Saving Behavior (SB).
- o Self-Control (SC) has a p-value of 0.000. Because the p-value is lower than 0.05, it means that Self-Control has a significant relationship with Saving Behavior (SB).

4. Regression Coefficient

The regression coefficient is to specify the statistical significance of each independent variable on the dependent variable.

The regression model formula is:

$$SB = 17.406 - 0.060 FL + 0.566 PI + 0.174 SC \quad (1)$$

The constant value of 17.406 means that Saving Behavior value will be 17.406 if all regression coefficients are 0. Financial Literacy (FL) has negative relationship with Saving Behavior. The regression coefficient of Financial Literacy is -0.060 which means that if Financial Literacy rises, it will give effect -0.060 to Saving Behavior. Financial Literacy does not give significant effect to Saving Behavior since the significance value is greater than 0.05.

Peer Influence (PI) has positive relationship with Saving Behavior (SB). The regression coefficient of Peer Influence is 0.566 which means that if Peer Influence rises, it will give effect 0.566 to Saving Behavior. Peer Influence gives significant effect to Saving Behavior variable since the significant value is lower than 0.05.

Self-Control (SC) has positive relationship with Saving Behavior (SB). The regression coefficient of Self-Control is 0.174, it means that if Self-Control rises, it will give effect 0.174 to Saving Behavior. Self-Control gives significant

effect to Saving Behavior variable since the significant value is lower than 0.05.

The independent variable that has the most dominant effect on the dependent variable can be seen from the highest Standardized Coefficients Beta value. Based on the statistic result, Peer Influence (=0.472) has the greatest effect on Saving Behavior.

5. Hypothesis Testing

To determine whether the hypothesis is supported or not supported, the results from regression coefficients calculation are used. Since this research is using a two-tailed test with 5% significance level, the t-value lower than -1.96 and greater than 1.96 and p-value lower than 0.05 will be determined as supported, other than that will be determined as not supported [54].

Table 3 - RESPONDENTS OCCUPATION

Hypothesis	t-value	p-value	Result
H1 Financial literacy is positively related toward saving behaviour.	-0.536	0.592	Not supported
H2 Peer influence is positively related toward saving behaviour.	8.902	0.000	Supported
H3 Self-control is positively related toward saving behaviour.	6.960	0.000	Supported

IV. DISCUSSION

A. Financial Literacy and Saving Behavior

The finding proves that there is no significant relationship between financial literacy and saving behavior. This is contrary to the research conducted by [40] which stated that financial literacy has a significant relationship with saving behavior of university students in Malaysia. Another research also stated the same thing where individual's saving behavior is significantly affected by financial literacy [55].

One possible assumption is that this result occurs because of the difference in questionnaire design used. This research adapts the financial literacy questions from Amari, Salhi, and Jarboui which asses the knowledge about financial with questions like quiz where the score of right or wrong answer is calculated [45]. Meanwhile, in another research, as conducted by Thung et al, the researchers use a five-point Likert scale questions to assess the financial literacy of their respondents [46]. The questions are more likely to be a subjective question that might rise bias [56] since the respondents evaluate their own financial literacy level, where the total score can be high even though their knowledge about financial is not that high. This resulted in higher probability to have a high financial literacy score compared to the result contained by the quiz.

Even though it is contrary to the result from another studies, it is interesting to find that someone who has a low financial literacy level can practice an effective saving behavior. This can be a prove that there are still a lot of determinants of saving behavior other than financial literacy. It has formed a new challenge for researchers to find other determinants of saving behavior.

B. Peer Influence and Saving Behavior

The finding proves that there is a positive significant relationship between peer influence and saving behavior. This is supported by the results of a study [13] which stated that peer influence has impact on individual saving behavior of young people in Canada. A good peer influence about financial can affect someone to practice an effective saving behavior. This result is in accordance with the study [32] which proved that individual's behavior is likely to be influenced by peer since peer is the prominent referent to an individual.

C. Self-Control and Saving Behavior

The finding proves that there is a positive significant relationship between self-control and saving behavior. The higher the self-control of someone (or the lower impulsivity), the more effective the saving behavior. This is comparable to the results of a research [14], which indicate that self-control is positively related with saving behavior. Financial self-control is also related with a positive attitude towards savings [57]. These show that individual self-control plays an important part in saving behavior.

V. CONCLUSION

Based on previous chapter, the result shows that financial literacy does not have a significant relationship with saving behavior while peer influence and self-control have positive significant relationship with saving behavior of young adults in West Java. This is based on the results of several statistical tests. From the results of multiple regression analysis, it is apparent that financial literacy, peer influence, and self-control can simultaneously explain saving behavior. Looking from the results of the partial regression analysis, it is evident that peer influence and self-control have significant and positive influence on saving behavior while financial literacy does not have a significant influence on the saving behavior of young adults in West Java. The results of the Standardized Coefficient Beta test show that the most dominant influence on saving behavior is peer influence. All of the results on this research might be differ from another research that use different method or measurement instrument, different object and domicile of the research.

This research does have several weaknesses that future researchers can further improve. First, the sample used for this research is only 294 due to the limited time and resources. Although the sample size has met the minimum criteria, the result of this research might be less representative since the sample used is not large enough. For future research, researcher can use other formula (e.g. Slovin formula) to determine the number of samples based on the number of population. Second, the distribution of this questionnaire is not evenly distributed throughout West Java since most of the respondents come from Bandung, Bekasi, and Depok City. Future researcher can make improvement with a better distribution. Third, since there are a lot of methods and instruments that can be used to measure each variable in this research, so the result of another method or instrument used might be different. Future researcher can try another method or instrument to measure the variables. Last, this research only focusses on three determinants of saving behavior. As seen from the statistical result, this research only explains 27.1% of saving behavior which means there are still many different determinants that can be analyzed. Future researcher can try to analyze other determinants that might affect saving behavior.

ACKNOWLEDGMENT

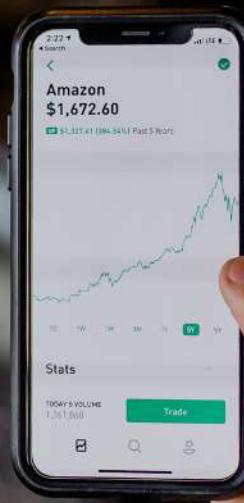
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Paper 31

Improving Business Performance Using Financial Planning towards Application Based Business: Study Case of Antri.in

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract- Indonesia is ranked as the fifth country with the greatest number of startups in the world (Yudistira), more than 80% of those startups were an application-based business. The problem arises that startup failure rates are around 90% (Neil, 2015). In fact, the financial aspect is the second most contributing factor that causes a startup to fail (Angelucci). In addition, we found that Antri.in also faced the same problem as most startups, which is financial problems. Antri.in is an application-based startup company that provides an integrated system to do online queueing. Antri.in implements the system of subscription fee as the company's main revenue stream and advertisement as company's secondary revenue stream. The researchers use financial modeling projection to project the company's finance. In 5 years, antri.in is projected to lose 7 billion rupiah as we are still in the developing / early stage. From the discussion and root cause finding, the reason for Antri.in loss is because Antri.in cash flow is bad, it needs a huge cost to operate while the company revenue and income is still limited. As the result, there are 4 solutions to prevent Antri.in's lost, which are cost priority, human resource plan, business model expansion, and exit strategy.

Keywords- Application, Financial Modeling and Planning, Business Technology, Internet of Things.

I. INTRODUCTION

The COVID-19 crisis has forced everyone to interact with and adapt to digital technology. All activities that were previously done manually, such as meetings, face-to-face meetings, and cash transactions, are now done online. Because it requires people to keep their distance and communicate online, both for shopping needs and online payments, the use of digital technology has risen dramatically during the pandemic. Based on data collected by Antaranews, the online service users for health consultation applications have increased by 600%. During the pandemic, not only the consumers moved towards online channels. But also, the companies in all sectors accelerated the digitization of their customer and supply-chain interactions and the internal operation by three to four years.

Antri.in is a startup company that provides an integrated system to do online queueing. Antri.in becomes an innovation to make it easier for customers who queue by using the platform web-mobile application based, which

allows the queuing process for a point of service to be done at anywhere. However, according to data, startup failure rates are around 90% (Neil, 2015). In addition, the financial aspect is the second most contributing factor that causes a startup to fail (Angelucci).

Based on company internal and external analysis, Antri.in already has a promising market and technology feasibility. However, from the perspective of finance, our founders have not calculated and predicted thoroughly. Antri.in did not have financial cash flow and financial planning. This situation makes Antri.in not running well and not having a clear vision towards business strategy. Because of that, Antri.in wants to prevent the failures by doing financial projection towards our business feasibility. By knowing the company's financial projection, we can determine the and the most suitable strategy for the company, whether it is an exit strategy or a growth strategy.

II. METHODOLOGY & LITERATURE REVIEW

The problem-solving method used for this research. The first researcher wants to know deeply about business analysis. In this stage, the researcher analyses the financial, marketing, operation, and human resources fields of business conditions. The researcher gets the financial condition of Antri.in is best not well because the internal business of Antri.in still has not generated revenue. To acknowledge and understand the topic that we want to discuss, the researcher will conduct a study about financial projection of cash flow, income statement, and planning for improving business performance. Researcher also using PESTLE Analysis, Porter's Five Forces, and Root Cause Analysis to analyzing the external and internal issues.

In a way to evaluate the alternative solution to financial planning for improving the financial business. This step also answers about a plan that is suitable for the company. The last step of this research is the implementation plan. This research discusses financial management with a business point of view only as delivered in the limitation of the research. While on every business, the financial plan needs to improve some factors in every business department. So, in this step, the researcher will evaluate the alternative of the financing to implement the project from solution formulation.

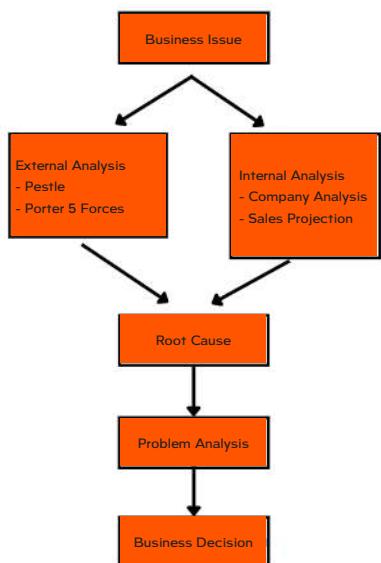


Fig 1.1 Research Framework

This research will use the conceptual framework above as a guideline and flow. It starts from a business issue related to the current condition of Antri.in. The second step is to break down the condition of the company into 2 stand points, which are external and internal perspectives. After knowing the condition of the company, this research will convey it into SWOT and root cause analysis. Lastly, business decisions can be made based on the root cause of the problems.

Furthermore, the researcher will use literature review from Keerativutisest (2021) about 6 steps of approach of financial feasibility.

1. Investment Rationale
2. Capital Investment
3. Assumption
4. Cash flow
5. Financial Returns
6. Entrepreneurial Decision

This literature review is used to determine the feasibility and condition of finance in Antri.in

III. RESULTS AND DISCUSSION

A. External Analysis

To deep dive the problem, we need to analyze the internal and external condition of the company. The researcher uses PESTEL Analysis to analyze the external condition

Political: The political situation in Indonesia based on digital startup laws can have a positive effect on the

industry we will enter in the future, where our innovations will be aligned with the law. This will help our innovation achieve the law's goal of improving the country's economy and people's lives.

Economical: Researchers conclude unstable economic factors might have a long-term impact in Indonesia, so we do not charge our users to use our service. We charge businesses for our service.

Social: Due to social distancing conventions and statewide lockdowns, the Covid-19 epidemic has increased digital technology use, according to Elsevier Public Health Emergency Collection. Pandemic made people reliant on technology. Daily activities show this behavior. Online application traffic is high and many activities are done online.

Technological: Businesses and schools are adopting work-from-home policies due to digitization (WFH). Design and governance of blockchain technology will become more important. Job allocation, cooperation, motivation, and work overload and presenteeism are expected to increase as the gig economy and gig workers grow. With increased digital presence comes increased workplace monitoring and technostress. Online fraud and security management research will grow. After the epidemic, internet regulation is crucial.

Environmental: Since May 2020, the Coronavirus pandemic had spread to 200 countries. This included most urban and rural areas. Coronavirus (Covid-19) has been a 2-year problem in Indonesia. This changed the market's behavior.

Legal: The World Health Organization (WHO) has asked everyone to stay away 6 feet to prevent the spread of COVID-19.

Researchers also use Porter's Five Forces economy in order to better understand industry competitiveness and to increase a company's long-term profitability. From Porter's Five Forces Analysis, the researchers concluded that Antri.in would face stiff competition as the industry showed mid- to high-level competition.

Table 1.1 - Porter's Five Forces Analysis

Porter Forces Analysis	Type	Explanation
Rivalry Among Existing Competitors	High	The number of competitors is considered high and the printing industry also has high growth.
Bargaining Power of Buyers	Medium	The buyers may influence the printing industry. Especially for those who really want to customize their shirts in small order. Most printing companies still give a high price for small orders, meanwhile there are more people who want to order small amount than who order large amount
Bargaining Power of Supplies	Small	There are lots of suppliers in this industry, so there is no outstanding relation between business owners and the suppliers. So business owners in this industry can easily change their supplier.
Threat of Substitutes	Medium	There are several ways to put a picture on a shirt like printing, coloring, etc. So there are no significant difference that cannot be substituted
Threat of New Entrants	Low	In this industry, printing technology can easily be imitated by others. Everyone can also learn and make a similar business. So the threat of new entrants is considered high

B. Internal Analysis

Researcher using 6 steps of approach of financial feasibility analysis by Keerativutisest (2021) including investment rationale, capital investment, assumption, cashflow, financial return and entrepreneurial decision.

Table 1.2 - Sales Projection of Antri.in

		Month	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue							
Revenue from sales			12,750,000	43,000,000	123,900,000	234,000,000	378,000,000
expense							
less:							
wages			672,000,000	1,003,200,000	1,068,000,000	1,128,000,000	1,188,000,000
Platform Development			100,000,000	20,000,000	20,000,000	20,000,000	150,000,000
marketing expense			120,000,000	180,000,000	180,000,000	200,000,000	200,000,000
asset expense			0	6,000,000	7,200,000	7,200,000	8,400,000
total expense			892,000,000	1,209,200,000	1,275,200,000	1,355,200,000	1,546,400,000
operating profit			-879,250,000	-1,166,200,000	-1,151,300,000	-1,121,200,000	-1,168,400,000
other income (ads)			7,700,000	22,850,000	42,000,000	43,400,000	42,000,000
income (exclude Tax)			-871,550,000	-1,143,350,000	-1,109,300,000	-1,077,800,000	-1,126,400,000
income tax			0				
net profit			-871,550,000	-1,143,350,000	-1,109,300,000	-1,077,800,000	-1,126,400,000

Antri.in is projected to gain revenue from subscriptions fee 12,750,000 in the first year, assuming we have successfully gained 45 branches in the first year. The sales revenue is also projected to be increasing every year. On the other hand, the cost will also increase. 80% of the total expense goes to wages/salaries for the employees. Antri.in follows the projected inflation rate and average industry salary to determine the salary of the employees.

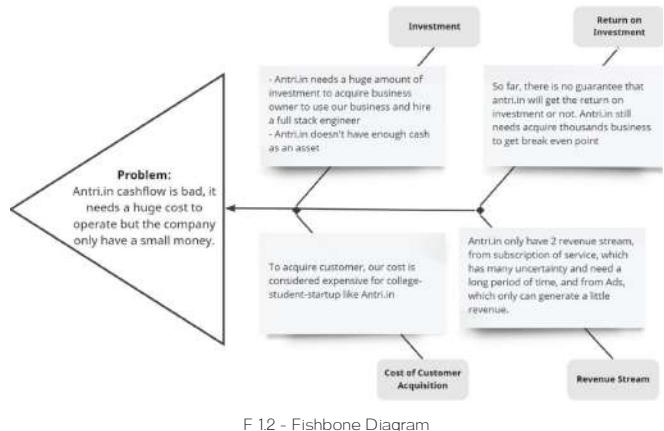
To specify and elaborate more where the projection sales is made, the researcher has made several assumptions towards it, as put in the table below.

Table 1.3 - Financial Assumption of Antri.in

	Year 1	Year 2	Year 3	Year 4	Year 5
Subscription Fee/month/branch	50K IDR	50K IDR	70K IDR	75K	80K
Market Growth	First Month: 5 2-6 month: +2/month 7-12 month: +5/month				
Platform Development Cost	Fee to make the platform 300M IDR	50M IDR for developing the product	50M IDR for developing the product	100M IDR for developing the product	150M IDR for developing the product
Wages	Founders: 10M IDR x 4 people 100 people: 2M IDR x 2 people Marketing team: 0	10.5M IDR x 4 people 8.4M IDR x 4 people 4.5M IDR x 2 people	11M IDR x 4 people 8.5M IDR x 6 people 3M IDR x 4 people	11.5M IDR x 4 people 9.5M IDR x 6 people 3.5M IDR x 5 people	12M IDR x 4 people
Marketing Expense	Social Media: 10M IDR /month	15M IDR	15M IDR	15M IDR	15M IDR
Asset Expense	Spare 500K every month to service the laptop/hardware	Spare 500K every month to service the laptop/hardware	Spare 600K	Spare 600K	Spare 700K
Other Income	From ads: 50K / month	From ads: 70K/month	From ads: 70K/month	From ads: 70K/month	From ads: 70K/month
Ads	25 businesses	50 businesses	50 business	60 business	50 business

E. Root Cause

To define the problem even more, the researcher use root cause analysis fishbone diagram to determine the core problem. This tool was picked of its simplicity in elaborating the problem and finding the root cause of problems.



F 1.2 - Fishbone Diagram

This analysis shows that Antri.in has a bad cashflow, which the income is small while it needs a huge amount of money to operate.

F. Recommendation

Seeing from sales projection and current condition of Antri.in, the researcher can conclude that Antri.in has a promising market and technology feasibility but not promising finance. Furthermore, the researcher proposes at least 4 recommendations to Antri.in.

1. Expand the business model, from only providing online queue system to Point of Sales. Therefore, the market will also be wider, and it will be easier for Antri.in to generate more revenue
2. Make a priority cost, understanding that Antri.in still has limited money and resources, it is mandatory for the stakeholders to create the priority list for their budgeting.
3. Plan a human resource strategy, knowing that more than 70% of the yearly cost comes from wages & salary, Antri.in must make a budgeting plan for human

resources by making it more effective and efficient. For instance, use the outsource service instead of hiring the permanent employee

4. Plan an exit strategy. According to the sales projection of Antri.in, in 5 years of projection there is no sign that the company will be gaining revenue in the near future. Seeing this, the stakeholders of Antri.in need to start thinking about the possible exit strategy. The researcher proposes 2 possible strategies:
 - a. Merge with another bigger competitor
 - b. Sell the business

IV. CONCLUSION

Antri.in has a promising market with technology feasibility, but the financial aspect of Antri.in with this particular revenue stream is not promising for the future life of the company. According to sales projection, the company is not worth to be continued by its own. So the best possible solution is to find the exit strategy of the company, whether it is to sell the business to another existing related-core-business company or merge with other company.

In addition, The first thing that Antri.in must do is to create a plan for exit strategy. While creating a plan for exit strategy, Antri.in can expand the market and try to surpass the target of sales and at the same time try to be decreasing the cost. Seeing that more than 80% of cost goes to human resources, so perhaps, Antri.in can use outsource human resources, instead of hiring new employee.

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Paper 32

The Effects Of Digital Maturity And Financial Performance On Stock Return: Evidence From Indonesian Tech Public Companies

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - As part of the digital technology trend, many companies disclose their digital activity to measure the firm's digital maturity to welcome new wave of data-driven digital technologies. In Indonesia, the technology sector has significant growth. Although digital technology trends are new, the technology sector is categorized as a good performer, measured by the vast stock return. Therefore, this study uses technology companies that have a high digital maturity index recorded from 2016 to 2020 with a total sample of 10 companies. Digital maturity measurement using textual quantification method or text query in the annual report. The number of digital activities mentioned is quantified using a tercile-based to avoid noise. Panel data regression is used with a Common Effect Model as well as the robustness test. The results show that digital maturity and profitability, as measured by Return-on-Asset (ROA), have no significant effect on stock returns. On the other hand, Sales Growth has a significant positive effect on stock returns. Therefore, investors and managers can consider aspects of sales growth to get a good stock return performance in technology companies. However, sales growth is susceptible to the company's external factors, so managers must focus on variables that affect sales growth.

Keywords - Technology Companies, Digital Maturity, Profitability, Sales Growth, Stock Return

I. INTRODUCTION

The fourth era revolution is also called the fourth digital wave as the new wave of data-driven digital technologies that change how companies organize, invest, and operate the business with the elements of data-driven technologies such as big data, data analytics, artificial intelligence, machine learning [1]. The acceleration of data-driven era industries is getting faster, marked by the emergence of new business models and the disruption that shifts all industries worldwide [2]. As the business landscape changes to digital, many companies apply new business strategies to create a better position in the market. The leader of companies tends to succeed in their company through digital business and become digitally mature. The organization needs to improve its digital strategy to create strategic options and flexibility that rapidly affects digital maturity environments [3]. Digital maturity implies the factors motivating the organization's digital transformation [4]. The firm that seeks to adopt

digital technology has to invest in digital infrastructure technologies. As a result, it would improve the management's decision-making, create better products or services, and perform better firm value creation [5].

Adopting a digital ecosystem for companies is essential to creating new business options and opportunities for the company's future. Digitalization offers opportunities to leverage the number of customers and sales [6]. The use of technology and digital ecosystems is concentrated in technology companies, especially cloud computing [1]. This digital ecosystem implies that technology companies have the opportunity to boost the number of customers significantly, especially if these companies have investments in technology infrastructure and create a digital ecosystem. In addition, data is the most valuable resource that companies have and is categorized as a form of capital that significantly benefits by unlocking markets, locking people in their platforms, and leveraging data sources [7]. As a result, digitalization in a company will increase business performance as indicated by enhancing the financial performance and having a positive correlation with business model innovations that will leverage the number of customers [6], [8], [9].

Indonesia has a scalable opportunity in terms of digital technology by transforming and reshaping the key accelerators as a solid foundation, such as mobile internet, cloud technology, IoT, and big data. As a result, Indonesia may become a prominent position in the economy by 2025 by implementing a holistic digital strategy and winning the digital era to accelerate economic growth to the next level [1], [10]. In addition, one of the critical issues in the G20 Presidency of Indonesia 2022 is digital transformation, which focuses on preparing the digital age as a new landscape to welcome the rapid digitalization of the new global economy. These phenomena indicate that digital transformation will affect almost all businesses in Indonesia and globally because they acknowledge that digital technology exists as an essential resource to face future business and will soon become a changing business trend.

In Indonesia alone, the technology companies are still growing. Although digital technology trends are new, the technology sector is categorized as a good performing sector in 2021, shown by the high return of the sectoral technology index. Apart from technology companies, other sectors also apply the same thing that adopts

digital technology to benefit and welcome the digital revolution age, for example, the telecommunication sector. These phenomena indicate that digital transformation in Indonesia has already affected the landscape of businesses. They acknowledge that digital technology exists as an essential resource to face future business and will soon become a changing business trend. Apart from adopting digital technology, financial performance is also one indicator that investors should consider because the firm likely tends to improve its financial performance to get the best result in the bottom line and attract investors. However, the technology companies are not aiming for profitability because they focus on growth rather than monetization in the early stage. For example, Amazon has not been profitable in many years and has become the largest US company [11].

In other words, it implies that the technology company is not valued at how much profit they make now but also for what they build in the future because most cases reveal that the tech companies' financial performance still has a negative value in the bottom line. Investors tend to invest their money in companies that fully adopt digital technology and implement the digital transformation with the expectation that it will give the best performance result [1], [12]. There is a lack of academic studies on this subject around the world. Previous studies have shown that the presence of digital technology or digital maturity needs to be done because the growth is uncertain, especially to welcome the new digital economy [13]. Thus, this is the opportunity to find out the most significant factor influencing the stock return in the technology sector and the sector that adopts digital technology for the operational basis, especially in Indonesia, because there has never been any study to research these problems before. Conducting an empirical study would matter to many investors in Indonesia to more wisely pick their sector to invest in and give an overview of how the digital maturity and financial performance affect the stock return in the technology companies.

II. THEORETICAL FOUNDATION AND HYPOTHESIS DEVELOPMENT

A. Digital Maturity

The advent of new business models and the technology disruption that shifts all industries worldwide are signs of the data-driven era industries are speeding up [2]. Digital refers to the basis for the existing disruption, which can improve the data collection process to become reliable information useful to increase human beings' well-being. As a result of new technologies that have replaced the old ones to become more digital, the business landscape has changed, namely implementing new strategies, models, and even operating models to run their business. Adopting

a digital ecosystem for companies is essential to creating new business options and opportunities for the company's future because digitalization offers opportunities to leverage the number of customers and sales [6]. In addition, the implementation of new technology becomes more strategic due to the adoption of the digital ecosystem, especially to transform and attract customers. These radical changes that have enabled businesses to find new ways to operate and produce new products or services are called digital disruptions [13].

The definition of digital disruption is the concept of environmental turbulence caused by technological innovation. It has been defined by several experts in their studies [6]. Still, digital disruption can act as a link between various resources and is not confined to the company's past fundamental changes [14]. The digital ecosystem and digital innovation are two essential variables in explaining aspects of digital disruption. However, further digital disruption on a wider scale is called digital transformation. In addition, digital transformation also adapts digital technology frequently and would affect the quicker product cycle and business process that would impact the new value creation for the firm [5]. Therefore, the firm's success in implementing the new technology and digital transformation would improve all customer experiences by improving the products and services [15].

When an organization undergoes a digital transformation, it may see significant changes in its business models and key business activities. As a result of the firm's development and adoption of digital technologies, the firm's stakeholders, including society, will likewise experience significant changes [16]. Digital maturity refers to the factors that motivate an organization's digital transformation. Digital maturity is also defined as a company's capacity to respond appropriately and systematically to the digital environment [4]. Digital transformation is a process of adapting to the digital environment in order to achieve a steady transformation [3]. In spite of this, digital maturity can predict a company's ability to comprehend and adapt to changing customer needs resulting from digital transformation. On the other hand, digital maturity can also be quantified to assess the level of maturity in an effort to create industry-leading competitiveness

B. Element To Measure Digital Maturity

The firm that seeks to adopt digital technology has to invest in digital infrastructure technologies. As a result, it would improve the management's decision-making, create better products or services, and perform better firm value creation [5]. In order to improve the organization's adaptability to the current environment, it is crucial to measure the digital maturity of various elements. Mobile,

analytics, the cloud, and big data are a few of the various elements used to evaluate digital maturity. However, online technology is the most prevalent component in business activities. This is consistent with the evaluation of digital technology to measure digital maturity with six elements of the approach, namely general technology (computer, programming, wireless, server), the internet of things, data science, process automation, artificial intelligence, and online technology [17]. These elements can be used as a basis for measuring digital maturity, specifically by analyzing the digital activities conducted by a company to increase its level of digital maturity.

C. Financial Performance

Financial performance indicates the information on a company's performance that reflects the management processes and the firm's results to generate profit. Financial performance is usually used to know how effective and efficient the organization is in achieving specific goals in a certain period. In order to increase the financial performance of a company, it becomes a requirement to attract investors. If a business has designed and implemented effective financial management, it will benefit the business by maximizing shareholders' wealth and contributing to the firm's value creation. There are a variety of ratios used to measure a company's financial performance, particularly to determine financial health-based decision making [18]. In addition, financial performance is typically used to evaluate a company's health based on several studies, including profitability and sales growth [1], [17], [19].

It appears that each business seeks to generate profits. Profitability refers to a company's ability to generate income, so the more significant the profitability, the greater the company's likelihood of growing [20]. Consequently, this profitability ratio can demonstrate how effectively the firm generates profits to maximize shareholder wealth. A company is considered to be growing if it is able to increase its top line or revenue in order to generate profits in the future. Sales growth is a metric that measures an organization's ability to increase sales over time. It can also be interpreted as a gradual condition of a company to increase sales through the process of developing internal conditions and enhancing the external quality of business expansion [21].

D. Stock Return

The simplest term of stock return is the return made or lost on stock investment in some period of time. In addition, stock returns have an impact on the capital side of a business. Consequently, stock returns are determined by the performance of a company and its industry, as well as the macroeconomy. Stock return can also be interpreted

as the increase or appreciation value an investor receives from a company relative to the stock's initial value over a specified time period. Typically, investors evaluate stock returns using fundamental and technical analysis. Moreover, investors also speculate to earn high returns by purchasing a stock at a low price and selling it at a higher price. To calculate a stock return, subtract the current value from the stock's value at the beginning of the investment, and then divide by the stock's value at the beginning of the investment. As a result, an investor will buy and sell shares with the expectation of receiving a capital gain as well as dividend payments from an investment in shares that have been made.

E. Value Corporate Disclosure and Digital Maturity Measurement

The obligation to publish a report containing management information and financial statements is one of the most important things when a company is already listed on a stock exchange. Not only for the shareholders, the information is needed also for the stakeholders, public, and government. There is value relevance listed in the company's published annual report information to determine the value of metrics such as growth and market penetration [22]. Moreover, textual analysis is one method for determining the value relevance of corporate information disclosure. Therefore, non-financial company information such as annual reports and corporate governance can have significant value relevance and provide value benefits. The textual analysis in question varies; a qualitative textual analysis was conducted in a previous study, using a text query to determine the digital value of maturity in information disclosure [17]. Furthermore, another study found that textual analysis contributes to the decision-making and earnings and return prediction of investors [23].

Corporate disclosure information that has available information for its stakeholders is possible to determine its digital maturity. This is supported by research indicating that the disclosure of a technology-related term can be considered a relevant value when determining a stock's price [24]. The organization needs to improve its digital strategy to create strategic options and flexibility that rapidly affects digital maturity environments [3]. It implies that the leaders must catch up with the digital investment plan and implement digital business strategies to create competitiveness and increase their digital maturity level. However, there is a delay in disclosing these digital activities to stakeholders. Consequently, the current measurement of digital activity is based on an analysis of digital activities conducted in the past [1].

Several previous studies measuring digital activity through text analysis methods with annual reports to determine a

company's value relevance have been evaluated [1], [17], [25]. Some studies used a quantitative digital keyword measurement method based on annual reports as a proxy indicator of digital transformation in their study of the effect of digital transformation on the stock prices of publicly-traded companies in China. The study concludes that digital transformation significantly reduces the risk of stock price crashes [5]. In addition, there is a textual proxy to measure digital activities and accomplished reliable analysis by dividing digital maturity into four parts or classifying it using terciles. Code 0 indicates that no digital activity is displayed, followed by 1, 2, and 3 in order from lowest to highest during a year [1]. This terciles-based measurement will eliminate the noisy raw word count when included as a predictor in panel data regression. It has been demonstrated that this method gives reliable results.

F. Conceptual Framework and Hypotheses Development

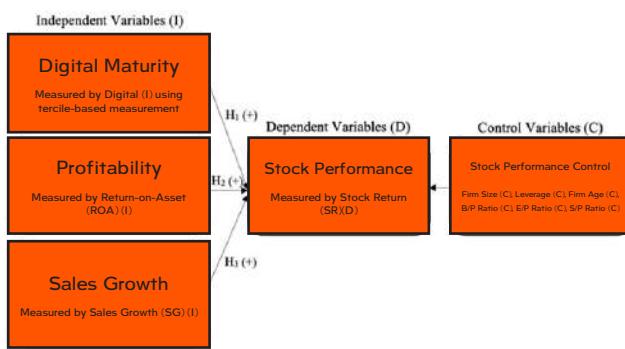


Figure 1 - Conceptual Framework

Previous research indicates that firms who utilize digital technology would have more public support since they provide superior products and services than their rivals [13], [15]. Moreover, customers have a high demand for technology firms since they give a great deal of transactional convenience; from a good viewpoint, it is evident that raising the value of consumers would increase the value of the company, resulting in favorable returns for shareholders [26]. Therefore, technology businesses will benefit from positively influencing stock returns resulting from a high degree level of digital maturity. Nevertheless, the relationship between digital maturity and stock returns is ambiguous [13], [17]. However, there are indications that investment in technology will positively affect stock values. Therefore, it can be predicted that enterprises with a high degree of digital maturity indicators of the characteristics above would have a beneficial influence on stock price returns.

H1: Digital maturity affects the stock return in the Indonesian technology companies positively.

Profitability ratios can be viewed as an indicator of a company's growth. Although profitability demonstrated the most essential performance indicator for businesses. As an investor, it is natural to compute this ratio in order to estimate the company's ability to make profits. Consequently, this profitability ratio can demonstrate how well the company creates profits in order to maximize shareholder wealth. In the case of technology businesses, it is assumed that they will generate a profit following monetization, but few are currently doing so [19]. However, it is believed that the tech company's profitability would generate positive stock returns.

H2: Profitability affects the stock return in the Indonesian technology companies positively.

As technology organizations increasingly rely on digital technology in their daily operations, it will be easier for the company to grow if it produces revenue quickly and benefits the company by increasing its market value. Previous research demonstrates that sales growth positively impacts stock price variations [27]. However, the research is not limited to industries with technology-based business models. Some studies discovered a significant association between the announcement of substantial revenue growth in financial statements that will lead to high stock price swings [28]. Therefore, it can be expected that firms with a high level of digital maturity or technological companies will have a beneficial impact on the stock price returns of the organization.

H3: Sales growth affects the stock return in the Indonesian technology companies positively.

III. METHODOLOGY

A. Research Sample

This study employs the purposive sampling method, which is a technique for selecting companies based on a set of predetermined selection criteria. The company must adopt technology as its operational foundation and be listed on the Indonesian stock exchange to meet the criteria. This company must also be involved in capital market transactions and be listed on the sector's primary board. This criterion ensures that the sample firms have good financial metrics that are not influenced by the characteristics in environmental factors in order to provide reliable information for the analysis. In addition, the company must provide a textual disclosure report or annual report from 2016 to 2020 for digital maturity measurement analysis needs.

The telecommunications industry has the highest level of digital maturity in Indonesia [29]. For optimal results, this sample includes all technology companies and all

telecommunications companies that have been listed on the Indonesian stock exchange that have a high level of digital maturity. Using these criteria, 10 companies have been selected as sample size, including 5 companies in the technology sector from 30 companies and 5 selected companies in the telecommunications sector from 10 companies that were listed on the Indonesian stock exchange between 2016 and 2020.

Table 1 - Sample Firms

No.	IDX Ticker	Company Name	Sector
1	ATIC	Anabatic Technologies Tbk.	Technology
2	EMTK	Elang Mahkota Teknologi Tbk.	
3	MLPT	Multipolar Technology Tbk.	
4	MTDL	Metrodata Electronics Tbk.	
5	PTSN	Sat Nusapersada Tbk	
6	FREN	Smartfren Telecom Tbk.	Telecommunication
7	EXCL	XL Axiata Tbk.	
8	ISAT	Indosat Tbk.	
9	LINK	Link Net Tbk.	
10	TLKM	Telkom Indonesia (Persero) Tbk	

Source: www.idx.co.id

B. Data Collection

The annual report is used to measure the digital activities that take place in the company. This technique is done to see how digitally mature a company is from one year to the next, from 2016 to 2020, the information available on the Indonesia Stock Exchange (IDX). The annual report is the primary source for looking at digital activities because it gives an overview of everything in the company over a certain period. This technique is an excellent way to measure data because it gives accurate results. Moreover, annual reports have been used to measure the company's digital activity. This method has relevance to the importance of a company's digital activities based on the report being made to the public. As a result, it will give valid data to be processed [1], [17], [30]. In order to measure digital activity in a company, this study uses an application that can analyze the text of a report. This analysis is an analysis of text queries using NVIVO 12. This app is able to summarize the number of words mentioned in the annual report regarding elements of digital maturity. Therefore, using this application provides complete data and minimal bias because it can capture words similar to the primary word.

To measure financial performance as measured by profitability and sales growth, as well as the dependent variable, namely stock returns, and control variables using reliable sources of information provided by the Indonesia Stock Exchange (IDX) from 2016 to 2020, namely the company's annual consolidated financial statements.

C. Independent Variables

The digital maturity score variable, which is labeled Digital, is used as an independent variable. This score is determined by the number of digital words that reflect a company's digital activities. This word calculation utilizes a query text model containing digital maturity measurement elements. The digital maturity element to evaluate the digital activities has been developed to measure digital maturity of Baltic State businesses [17]. It has been demonstrated that this method is reliable for measuring the company's digital activities by analyzing the number of words in the annual report. These components include general and online technology, big data and data science, IoT, artificial intelligence, and process automation. After obtaining the number of words from digital activities that have been measured by using NVIVO text queries for each annual report on information disclosure, the data must then be quantified using the tercile-based method developed by Chen & Srinivasan [1]. It seeks to avoid anomalous characteristics like bias and noise for each digital activity mentioned. Therefore, the obtained data can be quantified with a tercile-based index to provide a more accurate and measurable depiction of digital activity within an organization. The classification of the index is as follows.

Table 2 - Digital Maturity Tercile Codes

Index	Description
0	Company disclosures don't mention digital activity.
1	The company's digital words are in the bottom tercile of the year.
2	The company's digital words are in the middle tercile of the year.
3	The company's digital words are among in the most top tercile of the year.

This index is represented by the characteristics that have been extracted from text queries over a specific time period. This coding has demonstrated its efficacy and validity in avoiding noise and bias in digital activity measurements [1].

Return on Asset (ROA) is used to measure the profitability of a company's financial performance. Return on assets represents profit or return divided by total assets, which describes the amount of return a company earns by utilizing a number of its assets over a one-year period. The greater the ROA, the greater the asset utilization efficiency, allowing the company's profits to be used to acquire additional assets. Moreover, a number of prior studies used return on assets as an independent variable when calculating the effects on stock returns and found significant positive effects on stock returns [27]. This ratio is calculated by the formula below (F1)

$$ROA = \frac{\text{Annual Net Income}}{\text{Total Assets}} \quad (F1)$$

Sales Growth (SG) is the total increase in sales over a specified period. Although sales growth is sensitive to external factors [31]. Nevertheless, several studies have found a positive correlation between sales growth and stock returns [27]. This ratio is calculated by the formula below (F2)

$$\text{Sales Growth} = \frac{\text{Total Revenue}_t - \text{Total Revenue}_{t-1}}{\text{Total Revenue}_{t-1}} \quad (\text{F2})$$

D. Dependent Variable

The stock return (SR) serves as the dependent variable for hypothesis testing. This metric is based on research examining the impact of digital maturity and financial performance on stock returns [1], [29].

$$\text{Stock Return} = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (\text{F3})$$

E. Control Variables

Several previous studies have demonstrated an increase in the model of stock return. Therefore, the control variables adhere to several previously conducted studies. The control variables are Company Size (SIZE), Leverage (LEV), Company Age (AGE), Book-to-Price Ratio (BP), Earnings-to-Price Ratio (EP), and Sales-to-Price Ratio (SP) so that the control of this variable can influence the regression model and enhance the study's findings [1], [5], [32].

Table 3 - Control Variables

Variable	Symbol	Formula
Firm Size	SIZE	$\ln \text{Total Assets}$
Leverage	LEV	$\frac{\text{Total Debt}}{\text{Total Assets}}$
Firm Age	AGE	$\ln(\frac{\text{Number of Years}}{\text{Since Founded}})$
Book-to-Price Ratio	BP	$\frac{\text{Book Value per Share}}{\text{Market Price per Share}}$
Earnings-to-Price Ratio	EP	$\frac{\text{Earnings per Share}}{\text{Market Price per Share}}$
Sales-to-Price Ratio	SP	$\frac{\text{Sales Revenue per Share}}{\text{Market Price per Share}}$

F. Data Analysis and Research Model

To test the hypothesis, this study employs a panel data regression analysis to examine the data. In the panel data regression test, an Estimation Model Test is required to determine whether the data are suitable for the intended model. This estimation determines whether the model is appropriate for Fixed, Common, or Random Effects. After the model estimation is complete, the Classical Assumption Test or Best Linear Unbiased Estimation (BLUE) is performed to test for normality, autocorrelation, multicollinearity, and heteroscedasticity for giving the best fit output for the model to run test the effect of

digital maturity and financial performance to the stock return.

The research model is required to answer all research questions by running the panel data regression. This study aims to determine the impact of digital maturity on stock return, profitability, and sales growth on stock return. The data analysis uses panel data regression with ordinary least squares due to the cross-sectional and time-series analyses. To run all of these models using the EViews 12 application. It can be concluded from the estimation test that the Random Effect Model is the best choice for the model. As a result, there is only one model to test the effect of several independent variables to the stock returns. The model is built around a single formula, which is as follows:

$$\begin{aligned} SR_{it} = & \beta_0 + \beta_1 Digital_{it} + \beta_2 ROA_{it} + \beta_3 SG_{it} + \beta_4 SIZE_{it} + \\ & \beta_5 LEV_{it} + \beta_6 AGE_{it} + \beta_7 BP_{it} + \beta_8 EP_{it} + \beta_9 SP_{it} + \varepsilon_{it} \end{aligned} \quad (\text{F4})$$

IV. DATA ANALYSIS

A. Descriptive Statistics

Table 4 - Descriptive Statistics

List of Variables	N	Mean	Median	Max	Min	SD
SR	50	0.28	0.03	8.39	-0.69	1.27
DIGITAL	50	2.12	2.00	3.00	1.00	0.80
ROA	50	-0.24	0.02	0.17	13.63	1.93
SG	50	0.12	0.09	3.48	-1.00	0.53
SIZE	50	30.20	30.09	33.14	27.51	1.57
LEV	50	0.22	0.18	0.55	0.01	0.17
AGE	50	3.32	3.35	4.01	2.64	0.43
BP	50	1.43	0.69	7.63	0.23	1.65
SP	50	1.41	0.91	3.75	0.12	1.15
EP	50	0.04	0.05	0.84	-0.84	0.29

The table displays the calculated mean, median, maximum value, minimum value, and standard deviation for all variables utilized in the regression analysis. These results are based on information gathered from 10 sample companies from 2016-2020.

This result suggests that tech companies have implemented their digital activities by submitting annual disclosure reports with an average index of Digital greater than 1. Moreover, nothing is indicated on an index of less than 1 or 0, because digital companies should carry out digital activities. The negative ROA profitability index of -0.24 or -24% indicates that the average technology company is still incurring losses. Sales Growth indicates that technology companies experience an average sales growth of 12%, with a maximum of 348%.

B. Estimation Model Test

The Chow test determines whether the fixed effect model or the common effect model is more suitable for the model. Suppose Cross-section F is more significant than 0.05.

Table 5 - Chow Test

Cross-section F	Statistic	d.f.	Prob.	Alpha	Decision
Stock Return	1.435410	(9,31)	0.2161	0.05	Common Effect

According to the table above, the Chow test indicates that the panel data regression model has a probability (p-value) of Cross-section F that is greater than the 5% significance level (0.05). Based on these data, it is possible to conclude the common effect model is superior to the fixed effect model. Following the completion of the chow test, the Hausman test was conducted to compare the fixed effect and random effect methods

Secondly, the Hausman test is used to determine whether a fixed effect or random effect model will be employed for the model to be used in the regression data panel. The following information was obtained from the test results based on the Hausman test:

Table 6 - Hausman Test

Cross-section random	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Alpha	Decision
Stock Return	12.918686	9	0.1663	0.05	Random Effect

According to the preceding table, the probability value (p-value) of the random cross-section for the panel data regression model exceeds the 5% significance level (0.05). Based on these data, the random effect model is superior to the fixed effect model. After the Hausman test has been completed, the Lagrange Multiplier test is performed to compare the common effect and random effect methods.

Lastly, the Lagrange Multiplier test is used to determine whether a random effect or common effect model will be employed for the model to be used in the regression data panel. The following information was obtained from the test results based on the Lagrange Multiplier test :

Table 7 - The Lagrange Multiplier Test

Breusch-Pagan Both	Chi-Sq. Statistic	Prob.	Alpha	Decision
Stock Return	0.894973	0.3441	0.05	Common Effect

According to the table above the Lagrange Multiplier test results, the Breusch-Pagan probability value from the regression model is greater than a significance level of 5%, indicating that the Breusch-Pagan has a probability value (p-value) greater than a significance level of 5% (0.05). It can be concluded from these data that the common effect model is superior to the random effect model. Therefore, based on the three estimation results for the Chow test, Hausman test, and Lagrange multiplier test, it has been determined that the common effects method is preferable for the panel data regression model.

C. Classical Assumption Test

The normality test using the Jarque-Bera method on the model with a probability value less than alpha 5% (0.05) shows that the residual data is not normally distributed. As the data consist of panel data, the requirement for normality has been met. This result is consistent with the Central Limit Theorem (CLT) which states that if the number of observations (n) is greater than 30, it tends to have a normal distribution [33]. On this basis, additional testing can be conducted.

Table 8 - Jarque-Bera Normality Test

Panel Data	Jarque-Bera	Prob.	Alpha	Decision
Stock Return	27.72959	0.0001	0.05	Non Normal

Using the Breusch and normality tests, the autocorrelation test was conducted. The probability discussed in the previous chapter can serve as the foundation for making decisions.

Table 9 - Breusch-Godfrey Test

Breusch-Godfrey Serial Correlation LM Test	Obs*R-squared	Prob. Chi-Square	Decision
Stock Return	6.726801	0.0811	No Autocorrelation

Based on the Eviews output presented in the table above, the autocorrelation test value obtained using the Breusch and Godfrey method on a model with a probability value greater than 5% alpha (0.05), which indicates that the model does not contain autocorrelation. On this basis, additional testing can be conducted.

To check that there was no link between independent factors in testing stock returns or the dependent variable, a Multicollinearity test was performed on all independent and control variables utilized in the model data panel.

Table 10 - Multicollinearity Test

	Digital	ROA	SG	Size	LEV	AGE	BP	SP	EP	VIF
DIGITAL	1									1.83
ROA	0.17	1								2.64
SG	-0.26	-0.01	1							1.13
SIZE	0.35	-0.1	0	1						3.56
LEV	0.18	-0.49	-0.06	0.35	1					2.13
AGE	0.31	0.2	-0.01	0.6	-0.09	1				2.8
BP	-0.35	-0.12	-0.02	-0.38	-0.42	0.1	1			2.71
SP	0.14	-0.19	-0.11	-0.38	0.05	-0.17	0.3	1		1.76
EP	0.04	0.52	0.01	-0.27	-0.45	0.18	0.36	0.19	1	2.04

Based on the testing results for multicollinearity, there is no correlation evidence of multicollinearity in any of the variables, as measured by the VIF index, which indicates that the correlation is greater than 0.80 and the VIF is greater than 10. Therefore, in this instance, the model contains no indications of multicollinearity, indicating that the current model is reliable without multicollinearity; heteroscedasticity analysis can proceed.

The Breusch-Pagan-Godfrey test is used in the heteroscedasticity test to find out whether the panel data regression model has problems in heteroscedasticity or not.

Table 11 - Heteroscedasticity LR Test

Breusch-Pagan-Godfrey	Obs*R-squared	Prob. Chi-Square	Decision
Model 1	13.18184	0.1545	There is no heteroscedasticity

Based on the results of the heteroscedasticity test presented in the table above, the probability value of Obs*R-squared in each model is greater than 0.05, indicating that there is no heteroscedasticity problem. Therefore, it can be concluded that the heteroscedasticity assumption of the multiple regression model has not been violated. Furthermore, based on the classical assumption test, it is possible to test the panel of regression data because the conducted test is error-free and reliable for data analysis

D. Panel Data Regression

Table 12 - Panel Data Regressions

Variables	Stock Return (SR)	
	Coefficient	Prob.
Constant	8.066887	0.0028***
Independent Variable		
DIGITAL	0.103737	0.4907
ROA	-0.010004	0.5983
SG	2.022459	0.0000***
Control Variable		
SIZE	-0.337904	0.0028***
LEV	-0.496094	0.5068
AGE	0.748281	0.0363**
BP	-0.103975	0.2423
SP	-0.173479	0.0943*
EP	0.006045	0.9891
Statistics		
R Squared	0.807610	
Adjusted R-Squared	0.764323	
F-Statistic	18.65684	
Prob (F-Statistic)	0.000000***	

The table shows panel regression result where p < 0.1*, < 0.05**, < 0.01***

According to the above equation, Digital has a positive effect on Stock Return (SR) which indicates that when Digital increases, Stock Return (SR) will also increase. However, this effect is not significant. However, ROA is not statistically significant because it has a greater probability value at a significance level. Additionally, Sales Growth (SG) has a positive effect of 2.022459 on Stock Return (SR), meaning that when SG increases, so does Stock Return. The effect is statistically significant at the 1% level.

D. Robustness Test

Table 13 - Robustness Test Result

Variables	Robustness Check A		Robustness Check B		Robustness Check C	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Constant	7.347480	0.0003***	7.177714	0.0004***	7.219297	0.0006***
Independent Variable						
DIGITAL	-0.064763	0.6424	0.001484	0.9896	-0.018436	0.8997
ROA	-0.022125	0.1460	-0.030394	0.0273**	-0.029497	0.0371**
SG	2.163525	0.0000***	2.120813	0.0000***	2.115995	0.0000***
Control Variable						
SIZE	-0.327343	0.0001***	-0.331289	0.0001***	-0.333165	0.0001***
LEV	-0.224855	0.7390	-0.228018	0.6731	-0.247060	0.6962
AGE	0.966955	0.0011***	0.980895	0.0001***	1.003801	0.0006***
BP	-0.113023	0.1086	-0.157327	0.0139**	-0.154863	0.0177**
SP	-0.178409	0.0507*	-0.287330	0.0004***	-0.277997	0.0057***
EP	0.336090	0.3502	0.104629	0.7837	0.092388	0.8128
ATQ	-	-	0.306315	0.0673	0.296958	0.1139
LIQ	-0.063025	0.5066	-	-	-0.019338	0.8412
Statistics						
R Squared	0.927733		0.951299		0.950298	
Adjusted R-Squared	0.914062		0.939870		0.938921	
Prob (F-Statistic)	0.000000***		0.000000***		0.000000***	

The table shows panel regression result where p < 0.1*, < 0.05**, < 0.01***.

V. RESULT AND DISCUSSION

A. Result and Discussion

The relationship between Digital Maturity and stock returns is not statistically significant, as indicated by the panel data regression results and robustness test. Therefore, these results do not support the study's hypothesis because the insignificant effect is a result of the disclosure of digital activities, which may be due to be delayed and not produce immediate results, this is supported by previous studies indicating that the disclosure of digital activities is relatively slow and delays the company's performance results [1]. In addition, this result is not supported by several studies that suggest that high digital maturity will affect company performance because it increases efficiency, profitability, and stock returns [1], [26]. However, this study's findings support earlier research that finds no clear correlation between digitization and stock returns [13], [17]. Furthermore, these technology firms with a high level of digital maturity may have no impact on firm value as measured by stock returns because they not prioritize company's disclosure for digital activity and focusing on company's growth [11], [19]. Moreover, it is too early to observe this topic because the results of the companies studied are still quite limited, so the results provided are not optimal.

As measured by the ROA ratio, profitability exhibits a situation similar to Digital Maturity. The regression analysis results of panel data indicate that ROA has no significant effect on the stock returns of technology companies. However, on the robustness test the result is significant. This result is also influenced by the tendency of companies that are slow in publishing their financial reports, which has an impact on investors' delay in assessing the company's performance as measured by the ROA ratio to provide stock return projections and resulting in investors being paid less attention to this variable. This insignificant impact is due the fact that the company's management is unable to utilize total assets (current assets and fixed assets)effectively, and therefore cannot increase stock return. This decreases the allure of investing in the company for potential investors, as the return on shares decreases. This researcher agrees with previous research that there is no ROA effect on stock returns [35]. However, this result does not support previous studies with a positive correlation between ROA and stock returns [36]

In addition, Sales Growth (SG) generates different results. It has a positive effect with a significance level of 1%, indicating that increased sales growth will have a significant positive effect on stock returns in technology companies. In line with previous research, technology companies continue to prioritize growth, which is measured by sales growth [11], [19]. This result also confirms the findings of previous studies that a substantial increase in sales will have an impact on the rise in stock prices [28] It also indicates the investor are likely to invest the company that have robust sales. However, this result also requires further discussion because sales growth is a sensitive variable that can be affected by internal and external company factors [37].

B. Research Implication

Disclosure of digital activities in the annual report and profitability does not have a significant effect on returns for shareholders, this may be because the insignificant effect is a result of the disclosure of digital activities in annual report and profitability in the financial statement, which may be due to be delayed and not produce immediate results. In addition, ROA does not affect stock returns due to pay less attention from the investor in terms of the company's ability to generate assets. However, Because sales growth is the baseline that substantially impacts the company's return, the company's management can more effectively consider sales-sensitive factors. Numerous internal and external factors can influence the growth of a business. Furthermore, because growth is gradual, there will be numerous challenges to overcome at each stage [37]. External factors include economic, sociocultural, regulatory, political, and demographic conditions.

Therefore, exploiting opportunities necessitates the correct strategy, as internal factors are influenced by external ones [31]. This consideration is required because sales growth is essential in increasing a company's stock value, measured by stock returns.

In addition, investors can use the results of this study as a benchmark for obtaining returns in the technology sector because when a company indicates an increase in the number of sales, it will be sensitive and have a significant positive effect on stock returns due to the positive effect of the results of this analysis. However, investors need to understand that while sales growth positively affects company returns, company profitability does not affect stock returns. Therefore, this result suggests that investors can be wiser when selecting technology stocks, particularly companies with high growth that will also provide high returns in the future.

V. CONCLUSION

This study focuses on technology companies whose impact on stock returns is a result of measuring digital activity disclosure as a proxy to measure the digital maturity or digital maturity, financial performance as measured by profitability, and sales growth from 2016 to 2020. This study's descriptive analysis reveals that technology companies tend to have a relatively high risk of stock returns, as indicated by the relatively large standard deviation. Combining elements from previous research techniques with a noise minimization method in digital activity codes using the tercile-based method developed by previous researchers to measure digital activity [1], [17]. The results of the data analysis using panel data regression and robustness test indicate the insignificant effects of the use digital activities disclosure on stock return, the result may be due to be delayed and not produce immediate results. On the other hand, profitability as measured by the ROA also insignificant to the stock return, the coefficient is even negative. This negative effect on digital companies is still in its infancy because it is too early to observe its effects. Moreover the investor is paid less attention to the ROA variable on increasing the stock return. However, sales growth has the most significant positive impact on stock returns for technology companies. Because it is align with the fundamental aspect of valuing the company based on sales growth. However, the manager need to focus on the Sales Growth variable because it is highly susceptible to external company influences.

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Paper 33

Capital Structure Strategy for Improving Value of PT
Unilever Indonesia Tbk

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Abstract - The goal of the firm is to maximize the value of the firm and increase the shareholders prosperity. PT Unilever Indonesia Tbk (UNVR) is one of the fast-moving consumer goods (FMCG) companies and has been a market leader for several consumer goods products. During 2021, UNVR stock price was corrected for -44.08%, indicating a decrease in firm value. This was contributed by a declining financial performance as the net income decreased -19.62%. Financing decisions are one of the most important to consider in order to maximize the firm value. UNVR financing decision has been almost all equity financing with debt to capital ratio at 1.06%. Based optimal capital structure simulation using Damodaran framework, increasing the debt to capital ratio to 10% can minimize the cost of capital to 11.52% and maximizing the firm value to Rp 174,883,942 million. To apply the change in financing mix, it is recommended for the company to use the debt financing in a new investment and do stock buyback.

Keywords – Optimal Capital Structure, Firm Value, Financing Decisions, PT Unilever Indonesia Tbk.

I. INTRODUCTION

PT Unilever Indonesia Tbk. (UNVR) is one of the fast-moving consumer goods companies and has been a market leader for several categories of consumer goods products. UNVR business is grouped into two principal products which are Home and Personal Care, and Foods and Refreshments [1]. Home and Personal Care products contributed for 67% of total revenue, meanwhile Foods and Refreshments products contributed for 33% of total revenue during 2021 [2].

Currently, fast-moving consumer goods companies have been significantly impacted by market conditions as the pandemic created challenges for most of the firms and stock market. UNVR's stock price was corrected -44.08% [3] during 2021 and below the Indonesia market return (IHSG) indicating that investors earned less than the market return.

Decline in stock price was mainly driven by financial performance [4] that has been declining due to the fluctuating consumer demand [5]. Based on the audited financial statement as of 31 December 2021, UNVR's net income was experiencing a negative growth for -19.62% compared to the previous year, mainly contributed by sales decrease and high cost incurred.

As a public company, the main objective of UNVR is to maximize shareholder value and take decisions that are expected to increase the stock price. Declining financial performance and stock price movement shows that UNVR was ineffective in maximizing shareholder value. Therefore, the company needs to implement a new strategy to focus on actions that create value for shareholders by increasing firm performance and firm value [6].

Financing decision is one of the factors influencing the firm value. The basic long-term financing decision is a capital structure which is a financing composition consisting of debt and equity [7]. UNVR's debt ratio was 1.06%, representing the company was relying more on equity financing. As the firm relies more on equity capital, the cost of capital will be higher since equity holders will demand higher return. Thus, raising new equity as a financing decision is more costly compared to issuing debt.

Higher cost of capital also could minimize firm value as the future cash flow will be discounted with a higher discount rate. This also could lead into a weak valuation and might be seen as unattractive by investors. Considering this issue, this research will conduct a deeper analysis on the firm value of the company and capital structure strategy to maximize the firm value.

II. METHODOLOGY

This research was conducted through four stages. The first stage is about the background of the research, company profile, business issue, research objectives, and research scope and limitation. The second stage is the Company's business analysis by conducting internal and external factors analysis. The third stage is data analysis through financial statements, annual reports, and articles to determine what are strengths, weaknesses, opportunities, and threats for the company. The fourth stage is to construct the business solution by analyzing current cost of capital. In this stage, the solution of capital structure strategy will be conducted in order to improve UNVR value. The last stage will summarize the result from the previous stage and propose the recommendations for the Company. The recommendations will consider several aspects including internal and external factors, financial performance analysis, and valuation results.

Research methodology used in this research is a qualitative and quantitative approach. Qualitative approach is used

for external and internal factors analysis. Meanwhile, a quantitative approach is used to analyze the financial performance, perform the firm valuation, and determine the capital structure strategy. The source of data for this research is obtained from the secondary data including the company annual report, financial statements, and journals, without obtaining the primary data.

III. RESULTS

A. Business Situation Analysis

Based on the external and internal analysis performed previously, UNVR has several strengths including the strong brand equity, strong corporate governance, sophisticated physical resources, strong human resources capabilities and sustainable raw material handling. These strengths may lead the company to retain its position as a market leader and maintain its growth in the future. The company could also utilize the opportunity in the market such as large number of Indonesian populations as a target market, consumer preference in basic necessities [8], and technological development [9]. However, UNVR weaknesses such as the declining financial performance in the current year and high cost of capital incurred might cause the company exposed to threat including intense competition, risk of changes in brand preference, and change in economic condition [10] [11].

According to the analysis, the root cause of declining UNVR stock price is due to the ineffective capital structure which makes the cost of capital high and lowered the firm value. During 2021, the Company faced the challenge of the fluctuating consumer demand especially during the social restriction and increase in commodity prices. In addition, the company heavily relied more on equity financing which makes the cost of capital higher. As a result, the projected future cash flow of the company was decreasing and firm value generated perceived to be unattractive. Thus, optimal capital structure is required to minimize the cost of capital in order to maximize the firm value and achieve the goal of maximizing the stock price.

B. UNVR Capital Structure

Based on the calculation, WACC of the company is at 11.55% which is above the industry average of 11.03%. The high cost of capital might be due as the company cost of equity was higher due to a significant proportion of equity capital which is 98.94%. Therefore, this research will provide the solution on optimal financing mix to the company to minimize the cost of capital.

C. Capital Structure Strategy

The Damodaran framework will be used as a framework to determine the financing mix implementation of optimal capital structure [12]. Based on the framework, it has to be determined first whether the current debt ratio is over levered or under levered.

To calculate the optimal capital structure for the company, simulation was applied at a debt to capital ratio from 10% until 90% to obtain the cost of capital at each level of debt. The purpose is to determine the lowest cost of capital that will generate the highest firm value. The simulation was conducted using the worksheet from Damodaran for the optimal capital structure simulation [13].

Prior the calculation, several inputs required are summarised in Table I.

Table 1 - INPUT FOR CALCULATION

Input	Data	Source
EBIT	8,756,359	Financial Statement
Depreciation	1,076,908	Financial Statement
Capital spending	686,727	Financial Statement
Interest expense	184,876	Financial Statement
Tax rate	22.00%	Financial Statement
Pre-tax cost of debt	9.66%	Damodaran
Share outstanding	38,150	Financial Statement
Price per share	4,510	Yahoo Finance
Beta stock	0.69	Pefindo [14]
Cash	325,197	Financial Statement
Book value of debt	1,850,000	Financial Statement
Risk free rate	7.37%	PHEI [15]
Risk premium	6.12%	Damodaran
Country default spread	1.62%	Damodaran

Based on the calculation result, the growth rate is 7.60% which is higher than the applicable risk-free rate used in this research which is 7.37%. Since using a high growth rate might exaggerate the firm value estimation, a minimum rate will be used which is the risk-free rate of 7.37% for the perpetual growth rate.

Table 2 - CALCULATION RESULT

Calculation	Current	Optimal	Change
D/(D+E) Ratio	1.06%	10.00%	8.94%
Beta for the Stock	0.69	0.74	0.05
Cost of Equity [16]	11.60%	11.92%	0.33%
After-tax cost of Debt [17]	7.53%	7.90%	0.37%
WACC	11.55%	11.52%	-0.03%
Implied Growth Rate	7.37%		
Enterprise value	173,581,303	174,883,942	1,302,639
Value/share	4,510.00	4,544.15	34.15

Based on the cost of capital simulation result, 10% debt to capital ratio results in the optimal capital structure for the company with weighted average cost of capital at 11.52%. The projected optimal capital structure result shows a lower rate compared to the current cost of capital of 11.55%. Another consideration of the optimal capital structure is the firm value generated. It can be seen that the firm value is increasing to Rp 174,883,942 million compared to the current firm value.

D. Sensitivity Analysis

Sensitivity analysis is performed to gain a comprehensive analysis by considering drop in EBIT factor. Data for the last 10 years was obtained to calculate the changes in EBIT each year. Standard deviation was calculated to obtain the spread of EBIT changes as a basis to do a sensitivity analysis. The standard deviation of EBIT for the past 10 years is 14.34% which represents the dispersion of EBIT data to the mean. Thus, sensitivity analysis is performed until the 15% drop in EBIT to gain more precise analysis.

Table 3 - SENSITIVITY ANALYSIS

	Optimal	EBIT (-15%)
EBIT	7,679,451	6,527,533
Debt to capital	10%	10%
Cost of capital	11.52%	11.53%

According to the calculation, the result shows that even though EBIT dropped 15%, the optimal capital structure is still 10% of debt composition. However, when EBIT drops 15%, the cost of capital will increase by 0.01%.

E. Takeover Target

To determine whether a firm is a takeover target or not, several financial measurements will be used. According to the previous research by Meghouar and Ibrahim (2020) several financial characteristics that have a significant possibility of the firm becoming a takeover target include firm size, economic value added (EVA) and liquidity [18]. The research result shows that the takeover firms tend to have lower performance in terms of these ratios compared to the control group firms.

Table 4 - TAKEOVER TARGET POSSIBILITY

Measures	UNVR	Average Industry
Firm size	Market capitalization	173,906,500
EVA	NOPAT - (invested capital * cost of capital)	5,071,473
Liquidity	Quick ratio	0.42
		117,142,912
		1,261,034
		1.18

considering the firm size and EVA factors, it is assumed that is not a takeover target.

F. Investment Quality

Based on the previous result, it can be concluded that UNVR was not a takeover target. Thus, the next step is to determine the good project availability for the firm. If there is a good project, the company can consider taking the projects and use debt financing. If there are no good investments, the company should consider their shareholders preference in dividend. To determine whether the company has a good investment or not, return on equity and return on capital is measured as summarized in Table V.

Table 5 - ROE & ROC CALCULATING

	Return on Equity	Return on Capital
Net income	5,758,148	EBIT (1-T) 5,989,972
BV equity	4,629,319	Invested capital 7,061,819
ROE	124%	ROC 84.82%
Cost of equity	11.60%	Cost of capital 11.55%

Return on equity calculation shows a result at 124% with net income of Rp 5,758,148 million and equity book value of Rp 4,629,319 million. The return on equity is greater than the cost of equity which indicates that the company could generate a higher return compared to its equity.

Return on capital calculation with EBIT Rp 5,989,972 million, invested capital Rp 7,061,819 million, and tax rate at 22% resulted in 84.82% return on capital. This also has a greater ratio compared to the cost of capital which indicates the company effectively generates income that above the average cost paid for its debt and equity capital. Thus, the company could consider taking new projects with debt as a financing decision.

G. Implementing Changes in Financing Mix

It has been identified that UNVR was under-levered as the current debt ratio is lower than the optimal debt ratio. The optimal debt ratio based on the optimal capital structure is 10%, which represents that there is excess of debt. UNVR's optimal debt is approximately at Rp 17,390,650 million, indicating that the firm needs to issue additional debt amounting to Rp 15,540,560 million.

According to the paths for changing financing mix, under-levered firms can change the financing mix by increasing their leverage. If the firms need to increase leverage quickly, they can borrow money and do stock buyback. Based on the framework, UNVR investment quality is considered good as the return on capital and return on equity are higher than the discount rate. Hence, the firm can consider taking new investment with debt financing to increase their leverage.

Beside increasing the leverage amount by borrowing money, the firm also needs to reduce equity amount in order to make a considerable decrease in debt ratio. Thus, the firm also needs to do stock buyback to reduce equity and eventually will increase debt ratio.

Stock Buyback

The result shows that the firm value will increase if they are increasing debt to optimal level and do stock buyback. The firm can issue new debt to obtain funds in order to purchase its stock. In this analysis, it is assumed that the expected buyback price is the same with the current market price. However, it is possible for the firm to reduce the stock price before the buyback. The value per share after stock buyback is increasing from Rp 4,510 to Rp 4,547 which also indicates the increase in firm value. Debt ratio after stock buyback is moving towards optimal to 10%.

Table 6 - STOCK AND PRICE BUYBACK EFFECT

Current Stock price	4,510
# Shares outstanding before buyback	38,150
Expected buyback price	4,510
Current Debt	1,850,000
Debt at Optimal	17,390,650
New Debt issued	15,540,650
# Shares bought back	3,446
Shares outstanding after buyback	34,704
Enterprise value after buyback	174,883,942
+ Cash	325,197
- Debt	17,390,650
Equity value after buyback	157,818,489
/ Number of shares after buyback	34,704
Value per share for remaining shares	4,548
Debt ratio	10%

Designing Debt

Choosing the right financing instruments for the firm is important as it will determine the debt characteristic of the firm. According to Damodaran (2014:680) a quantitative approach can be used to design debt by estimating the firm's sensitivity to changes in several macroeconomic variables which are 10-year government bond interest rates, GDP growth, inflation rate, and currency exchange.

Table VII illustrates the sector estimates where the firm's business operates. UNVR operates two business divisions which are Home and Personal Care (HPC) and Foods and Refreshment (FNR). The estimations are obtained from the average of all firm's value for each year during 10 years backwards. The regression analysis is performed to analyze the sensitivity of firm value against the macroeconomic variables.

Table 7 - SECTOR ESTIMATES

Div.	Weight	Duration	Cyclical	Inflation	Currency
HPC	66.70%	-3.967	0.184	0.149	0.574
FNR	33.30%	-2.618	0.088	0.177	0.083
Firm	100.00%	-3.518	0.152	0.158	0.410

Based on the regression sector estimates result, the debt duration for the firm is around 3 to 4 years. The cyclicity, inflation, and currency sensitivity show similar results with historical data regression, where the firm value fluctuation moves according to the movement of these variables.

H. Debt Design Conclusion

Based on the analysis of the firm value and operating income sensitivity, the summary of UNVR's debt should be:

1. The firm could issue a long-term debt which has a duration approximately 3 to 4 years. This is also reflecting the firm's asset life for machinery and equipment which are between 3 to 5 years.
2. The firm can use floating rate debt since the firm's operating income is increasing along with interest rates.
3. UNVR's firm value and operating income sensitivity show that the fluctuation is in line with the currency movement. Thus, debt should be in rupiah currency as the firm might be benefited as the rupiah strengthens. In addition, it also matched with the majority of revenue generated which is 93.18% revenue generated from domestic sales.

Currently, UNVR has Rp 1,850,000 million bank borrowing with fixed rate with all borrowings denominated in Rupiah currency. If the firm is planning to move into optimal capital structure and accepts the debt design recommendation, UNVR can swap its existing fixed rate with floating rate to reduce the risk of interest rate arises from borrowings.

IV. CONCLUSION

UNVR shows a decreasing financial performance with net income of Rp 5,758,148 million, decreasing for -19.62% from previous year which caused a decrease in firm value. According to the debt to capital ratio, UNVR financing has been almost all equity financing with a debt ratio of 1.06% in 2021 that resulted in high cost of capital. This contributes to the low firm value which might be seen as unattractive by investors.

Based on the optimal capital structure simulation, the optimal debt to capital ratio at 10% resulted in minimum weighted average cost of capital at 11.52%. The optimal capital structure can generate the maximum of the firm value which is Rp 174,883,942 million, an increase for Rp

1,302,639 million from Rp 173,581,303 million.

This was in accordance with the optimal capital structure theory where the company needs to minimize the cost of capital in order to maximize the firm value (Gitman and Zutter, 2015:587). This is because the present value of future cash flows will be maximized if the cost of capital as a discount rate is minimized, thus generating a high firm value.

To increase the debt ratio into the optimal capital structure, UNVR can issue new debt with long-term duration between 3 to 4 years, floating rate interest, and denominated in Rupiah currency. It is also preferred for the firm to issue banks than bonds since issuing bonds is more difficult and costly as the firm needs to provide all information to the rating agency.

V. IMPLEMENTATION PLAN

According to the Damodaran framework, UNVR is underlevered since the current actual debt ratio is 1.06%, meanwhile the optimal debt ratio is 10%. In implementing the financing mix, the company can consider new investment opportunities and use debt as financing. If there is no good investment, the company should determine whether to pay additional dividends or do stock buyback.

Based on the overall research process, UNVR could invest in new projects to enhance its firm value. By investing in new projects or products, the company could obtain a new revenue stream from their new products, thus increasing the free cash flow to the firm.

According to the capital structure strategy analyzed in the previous chapter, it is recommended for the company to invest in new projects using the debt as financing to increase the debt ratio into the optimal capital structure. This could assist the company in increasing the firm value by reducing the cost of capital as the company will use more debt capital compared to the equity capital.

In addition, the company capital structure will also be in accordance with the Pecking Order Theory where the hierarchy of financing begins from the internal retained earnings, followed by debt, and stock issuance. Thus, the company could increase the firm value by investing in new projects using debt as financing to minimize the cost of capital.

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Paper 34

Financing Public Infrastructure Projects in Indonesia:
Analysis of Most Applicable Scheme for Developing
Transportation Infrastructure

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Abstract - The beginnings of the economic growth Indonesia seeks in the next 15-30 years slowed down by the COVID-19 outbreak recently. This led to restructuring of state-budget funds (APBN) to focus on healthcare and the post-pandemic recovery. Creative financing solution is needed to replace dependency on the APBN. How will the Indonesian government save state budget funds during this post-pandemic era in developing public infrastructure in Indonesia, especially transportation infrastructure? What will be the most appropriate financing scheme to develop transportation Infrastructure in Indonesia? What are the factors in deciding a proper financing scheme for transportation infrastructure in Indonesia? The decision making process of applying different financing methods and schemes based on different factors. Given that Indonesian public transportation infrastructure development is largely in its early phases and does not currently provide any current revenue streams, in order to minimize the risk, considerations about future sustainable revenue generation are also essential. It has also been demonstrated that, in exchange for the greater risk involved in investing in the infrastructure sector, this approach has a lot to offer for private companies.

Keywords - Development, Financing, Infrastructure, Public-private Partnerships, Public-transportation

I. INTRODUCTION

A. Background

Going into the 21st century, Indonesia has set goals in economic development. As of today Indonesia has been a huge prospect in the global economy, predicted to jump the ranks up to an astonishing 7th largest in 2030. This will mainly be driven by several aspects, especially with the rise of Asian countries, technological growth, and urbanization [5].

In accordance with the development of the economy, essential development needs to be made. Infrastructure has been the key aspect of a growing country, with this, a country could connect point A to point B, connecting points for essential supply chains, and moving people all around the country [10]. Although this is an important and essential matter for a country to move forward, Indonesia's national investment in public infrastructure has been slowly progressing at a not very fast pace since

the 2000s compared to China and Vietnam, which has been investing 7 percent of their Gross Domestic Product (GDP) more in public infrastructure per year. Indonesia has been stuck in the near 3 percent level for investment in public infrastructure compared to the rough benchmark of 5 percent from the Asian Development Bank to be a minimum level for developing countries [4].

"Recent World Bank data suggests that the stock of capital in Indonesia is still very low. The World Bank estimate is that in 2014 both the United States and Australia had a national stock of capital of around US\$1 million per person. By comparison Indonesia had around US\$50,000 per person" [4].

Fast forward to recent times, Indonesia's new projects planned have been spread across multiple infrastructures from new airports, seaports, railways, and roads. A major breakthrough was acquired with the total length of Indonesia's highway/toll-road increased significantly in the past decade, with more cities are connected.

B. Problem Statement

In 2019, we saw the peak rapid growth and major MoU signings of new planned public infrastructure projects in Indonesia. However in 2020, Indonesia saw something unexpected coming into the planned path, as the COVID-19 pandemic spread rapidly into the country in March, several infrastructure and newer planned investments were delayed. Activities related to construction and planning have been postponed to be a priority in 2021 instead as per the instructions from the Indonesian Ministry of Public Works and Public Housing. With other budget changes, major state-fund allocation was focused on health infrastructure for building emergency COVID-19 hospitals, quarantine, and medical facilities.

"The ministry reallocated Rp 44.58 trillion, 37 percent of its 2020 budget, to finance infrastructure for COVID-19 emergency measures, including the construction of Galang Hospital in Riau Islands. The hospital, which began operations in early April, is used as a quarantine and medical facility to handle COVID patients. The COVID-19 crisis has also affected the construction of other infrastructure projects in Indonesia, including the Jakarta-Bandung high-speed railway project that is expected to be delayed. Highspeed Railway developer PT Kereta Cepat Indonesia China had planned to finish the project

and start operations in 2021" [13].

The unexpected turn of COVID-19 has definitely impacted significantly to the current President Joko Widodo's administration plan, with recent developments in the pandemic started to slowly recover, Indonesia's Minister of Finance, Sri Mulyani Indrawati has stated that the 2023 state budget will be plan to prioritize spending on healthcare. As of 2020, this has changed to slowly focus on healthcare with an increase of Rp113 Trillion to Rp172 Trillion, and in 2021, it was raised up to Rp312 Trillion, and in 2022 to be expected around Rp255 Trillion [3].

According to the Vice-Minister of Indonesia's MoF, he stated that the state budget is very limited in order to maintain a healthy level of sustainable funding. With infrastructure development the key to long-term economic growth, the future of mobility, productivity, connectivity, and access must be built sustainably. The Vice-Minister also said that the Government gave great support to infrastructure development. The support includes the provision of State Capital Participation (PMN) in several construction State-Owned Enterprises (SOE/BUMN) infrastructure development expenditures at several Ministries/Institutions, and providing guarantee programs.

C. Research Question

(1) How will the Indonesian government save state budget funds during this post-pandemic era in developing public infrastructure in Indonesia, especially transportation infrastructure? (2) What will be the most appropriate financing scheme to develop transportation Infrastructure in Indonesia? (3) What are the factors in deciding a proper financing scheme for transportation infrastructure in Indonesia?

D. Research Objective

Backed by the problem stated, this research will help the invitation of other creative source of financing, based on the statement from the Ministry of Finance (MoF) of Indonesia.

"I would like to invite all observers and policy makers in the infrastructure sector to be able to look at the whole comprehensively, namely looking at the overall infrastructure needs and also looking at our overall ability to finance. Government sources are one of the most important sources for infrastructure, but as time goes on we have to be able to make more creative financing" [8].

The government is open to other methods of infrastructure investment. This research will help find appropriate alternative financing to help develop infrastructure and in this case will focus on transportation infrastructure in Indonesia during the COVID-19 pandemic to help reduce

dependency on state funds.

II. LITERATURE REVIEW

E. Funding and Financing Infrastructure

In defining the word 'Funding' in Infrastructure, this refers to the context of having the funds from taxpayers and state budget pay for the infrastructure projects as subsidized by the government. Although 'Funding' and 'Financing' almost could be defined the same way, 'Financing' is leaning more towards public funds that includes public borrowings, international grants, and private funds from infrastructure companies, commercial banks and investors.

"When it comes to infrastructure investment, there are two separate concepts. Financing is defined as the act of obtaining or furnishing money or capital for a purchase or enterprise. Funding is defined as money provided, especially by an organization or government, for a particular purpose. For infrastructure investment, however, communities almost always look to external sources for money to complete projects. This money can be in the form of loan (financing), or grant (funding), or donations (funding), or investments from partner agencies (VTrans, for example; funding) or programmatic below market loans (State Revolving Funds or USDA-RD, for example; a mix of financing and funding) Financing sources need to be paid back but funding is often not if the work is performed in accordance with the funding agreement. Further, these two concepts are interrelated in that funding must be present to serve as a source of repayment for financing" [15].

F. Public Infrastructure Financing

Recent Patterns

Depending on the country, each government would adopt different financing strategies that may vary to one another, which resulted in different financing variations across the world. The aspect that might be seen in the differences are from;

"infrastructure characteristics – affecting the user profiles and revenue-raising capacities of particular assets; fiscal and macroeconomic conditions – potentially restricting use of particular financing vehicles because of their budgetary consequences; institutional arrangements – defining the legal and regulatory framework as well as the intergovernmental relationship within which public infrastructure assets are operated and financed; perceptions of the role of government – and voters' expectations for the involvement of government in delivering specific services and managing the economy" [2].

G. Alternative Solution for Infrastructure Financing in Indonesia

With recent roadmap plans for Indonesia by the Indonesian President, the government has set to push infrastructure development a step further, with an acceleration construction Indonesia has not seen before, the government required over \$400 Billion in the period of 2015-2019. With limited budget, the government has turned into private investment, which in order to attract it, they have issued a certain amount of new initiatives such as; The Public-Private-Partnership; a New Land Acquisition Law; Investment Coordinating Board One-Stop Service, New Fiscal Support Law; Created a new unit in the Ministry of Finance for Public Private Partnership (PPP) Strategize Priority Projects through Indonesia Committee for Acceleration of Priority (KPPIP) Established Government of State Assets Agency. Although the government has set a number of new initiatives there are still new challenges from the financing models available that are constrained by;

"Issuers are bound to fulfill their existing loan covenants, commonly the debt/equity ratio (which is used to measure an entity's financial leverage). Additional debts may result in a breach of those loan covenants and, consequently, may have the result of putting them in a default position where they are required to pay in full the respective existing loans; Specific investors, like banks and pension funds, who may have the capital to invest, may be restricted by law to investing only in certain types of securities; Tax implication of certain type of securities may not be favorable to either the issuer or investors or both; Significant expertise and resources on the part of the investor may not be available for it to assess the risk/return profile of the investment throughout its economic life" [11].

Thus, related stakeholders must utilize the appropriate financing models for the specific projects that will depend and vary according to the objectives set. There might be several factors such as structuring the models based on Indonesia's requirement for taxation and accounting, in order to have the appropriate model for both investors and the project itself.

H. Equity Instrument: Public Private Partnership

As one of the alternative ways of financing, PPP has been a breakthrough in the world of infrastructure and public works, as it eases the government's burden in funding projects. The concept for PPP is;

"Public-private partnerships in infrastructure development involve private sector participation in any or all of the

design, construction, financing and operation phases of a public utility infrastructure, service or both. Examples of infrastructure developed through PPP models abound worldwide. It has been used in industrialized countries, such as the UK and Germany, and in newly industrializing countries with tremendous infrastructure demands, such as China and India, as well as in some developing countries in particular in Latin America. The capital-intensive nature of basic infrastructure and competition for limited government budgetary resources have prompted governments to invite private investors to fulfill the widening demand-supply gap for infrastructure while the governments are endeavoring to meet the social commitments within the fiscal constraints. Attention has been drawn that the level of adoption of PPPs across the world differs widely. Typically, in industrialized countries, PPPs are used in areas of public service provision including education, health services, waste management and public buildings. While in industrializing countries with enormous needs for basic infrastructure, PPPs are often seen in the power, water or road sectors in order to sustain the countries' rapid economic growth" [1].

PPP is not just a regular partnership between public and private, it serves as a mutual source of benefits. PPP implies that the private company could be allowed to have responsibility and control for the project in a period of time, while giving back the responsibility and operation to the public sector after the end of a contract. This will benefit private companies as it would be enough to return their investment from payments like fees, tariffs, and other payments.

Having the objective of giving public projects to private companies, private companies will be responsible for financing, management, operation, maintenance, construction, and design of the public infrastructure. The public sector will take responsibility in supervision, monitoring, and assuring that everything will be delivered according to the standard and planning. Usually the PPP projects will see the public sector putting some of their key people in higher positions in the project to oversee in conjunction with having key people from the private sector for the execution. Even though PPP varies among countries, PPP will bring the same characteristics anywhere, as it will bring gains from risk and responsibility sharing, having private investment as the key element from the model, having long term contracts between stakeholders, and innovation. Thus, PPP is mainly driven by having to push public infrastructure without having to splurge public and state funds too much.

Advantages of PPP

The advantages of PPP are: having more efficiency than conventional methods in providing public projects;

employing private sector business practices and leadership experience to restructure public services; creating more competition in the industry; and removing the burden of having state funds all over for funding projects.

"For example, in Germany, the basis for the decision whether to adopt a PPP approach or to procure the project conventionally through government resources lies in the evaluation of the Public Sector Comparator (PSC). Each PPP project is, before being tendered, compared to traditional public sector procurement by a so called "value for money test" (or efficiency comparison test) which comprises quantitatively a comparison of the net present value of all cost occurred during the intended contract period, i.e. for design, construction, finance, maintenance, operation etc. for the traditional (PSC) and the PPP option" [1].

Efficiency gain is the reason for having a sustainable public saving model, which will transfer risks to the private sector, payment upon performance, competition in PPP tenders, utilization of new management from the private sector, new incentives, and fewer administrative costs.

Elements of the PPP Business Model

Being the models of PPP would vary depending on the country, there are still the standard PPP procedures that will not be affected by each country's legal, political, administrative, economic, institutional structure (See Figure 1) PPP could be defined into different parts such as; Basic Model which revolves around urban development or public service provision; Kinds of Partnership, is it vertical or horizontal; Types of Asset, a single building or bundle/network; Sector or Sub-Sector of application lies between transportation, supply/disposal, and public real estate; Mode of Sector Financing which could be either budget financing, and user financing (through toll tariffs, ticketing, etc.) Type of Works, is it a new construction, extension, widening, or rehabilitation; Forms of Privatization which is either formal, functional, or material; Type of Contract Model, a Design-Build-Finance-Operate (DBFO) Concession (Build-Own-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), Build-Own-Operate (BOO) etc.) Mixed Special Purpose Vehicle (SPV), etc.; and Type of Project of greenfield or brownfield projects. (See Figure 1) [1].

Basic Model: - urban development - public service provision	Kind of Partnership: - vertical - horizontal	Type of Asset: - single building - bundle or network
Sector or Sub-Sector of application: - Transportation - Supply / Disposal - Public Real Estate	Mode of Sector Financing: - budget financing - user financing (toll, vignette ticketing etc.)	Type of Works: - new Construction - extension - widening - rehabilitation
Forms of Privatisation: - formal - functional - material	Type of Contract Model: - DBFO - concession (BOT, BOOT, BOO etc.) - mixed SPV - etc.	Type of Project: - green field - brown field

Figure 1 - Elements of The PPP Business Model

I. Debt Instruments: Bonds

Bonds are considered to be one of the most common larger sources of financing for companies. Bonds are generally a fixed-income instrument that could be issued by a corporation or government that is used to help finance projects which are held by the owners of bonds that are the creditors or debtholders. Bonds have several forms, such as; convertible bonds; project bonds; preferred stock; corporate bonds; project bonds; sovereign bonds; and syariah bonds (sukuk).

Project Bonds

For infrastructure projects, project bonds are used as standard securities that will help finance a specific particular project. Project bonds are then issued and could be sold in the market and even could be held privately.

"Project bonds are a salient part of this taxonomy: they are an emerging part of infrastructure finance and a growing source of long-term funding for infrastructure projects. Project bonds are issued solely to finance a specific project, whereas straight corporate bonds bear the credit risks of the issuing entity whose projects are diversified across a portfolio of assets. In this sense project bonds are more risky because the risk of loss to credit holders is higher for any one specific project versus a diversified portfolio of projects. Bonds become a more viable option when project volume is large (in excess of USD 100 million) and where longer duration finance is needed" [17].

Project Bonds are different compared to loans as they are more standardized in terms of contract in comparison to loan agreements. Selling bonds in the public market also requires registration through the regulatory institution, which will have more benefits in terms of transparency, more liquidity and also audited financial statements that are based on the regulations.

Corporate Bonds

For corporate bonds, these are securities that are standardized to finance a corporation's balance sheet, as this is a very dependable source of financing for firms. The usual issuer of this are public infrastructure companies that want to raise sources of financing through the public markets or events held privately. Corporate bonds have longer long-term financing with a fixed set coupon rate and also pushes high levels of transparency and liquidity as with the requirement of financial reporting for publicly listed ones.

"Instead of bearing the risks of an individual project, corporate bonds bear the risk of the issuing corporate entity. Thus credit-worthiness is determined by an issuer's general ability to service the debt, making them less risky than project bonds. Corporate capital structures can be complex with many debt issues at varying levels of seniority; issuance of corporate bonds is tied to the general financing strategy of the corporate balance sheet. Credit quality can range from investment grade to below investment grade" [17].

Larger corporate bonds could benefit from more liquidity by being included in major bond indexes. Index funds and Exchange Traded Funds (ETF) provide access for investors whether its institutional or retail access to bond markets.

Sukuk/Syariah Bonds

Sukuk or Syariah Bonds are securities that adhere to based on syariah law of Islam. Sukuk differs from regular bonds, as they are not an interest-bearing instrument. Instead Sukuk are designed to give profits by changes in gain and losses in the capital, and income to holders in terms of payments periodically. Sukuk is very popular in Islamic and Muslim majority countries, which are often issued by the government, private sectors corporations.

"There are multiple structures that can include project finance sukuk, asset-backed sukuk, sale/lease-back structures or rent/income pass-throughs. The asset-backed nature of Islamic financial instruments make sukuk well suited to infrastructure assets. Generally the underlying principle of such instruments are a sharing of risk and return amongst the parties in a transaction - cash flows are determined by incomes generated by the asset, and the return to investors is linked to the performance of the asset. In effect, sukuk resemble Public Private Partnerships due to this risk- and return-sharing arrangement." [9]

With recent trends of sukuk in the market, having a generally new instrument means that liquidity could still

be low, and especially for a smaller size sukuk. As there are also trends for greater volumes of sukuk to receive a growing demand to have diversification in Islamic or Muslim majority countries from western countries.

J. Debt Instruments: Loans

The term loan is generally described as an instrument of credit vehicle, where an amount of money from party A could be lent out to another party. In exchange, party A expects future repayment of the sum amount of money back, in which the lender will add charges of interest that the borrower party must pay an extra amount back. Loans usually are issued for a one time deal, and have different kinds of forms.

Bank Loans

Bank loans are considered to have the risk lower than any other type based on the risk scale debt of project finance. Bank loans generally have collateral to be more secured with an added amount of loan given when the asset's liquidation value has the ability to earn cash in order to pay debts.

"Non-recourse asset-based debts such as loans differ from generic credit risk such as unsecured corporate bonds in that the performance of the asset itself is critical to service the debt, rather than the general ability of a debtor to meet payment obligations. Repayment of the loan is not necessarily tied to the success of the project during the operation phase; but in the event of a default, lenders drive the restructuring process" [14].

Bank loans give the comfort for the investors that the asset would perform itself to cover the debts, rather than seeking constant obligation for the debtor to pay the exact amount. In the case of a project, the success completion does not generally mean it is time to repay back.

Direct Lending

Direct Lending is not generally a financing instrument, but it is one of the schemes in raising finance for infrastructure financing. Direct Lending usually is sourced through experts that could bypass capital markets to lend directly to projects from large investors. Direct lending also means that,

"An institutional investor invests in infrastructure loans originating by an internal investment team or another institutional investor under the direct and co-investment model. The lead underwriter forms a syndicate and keeps a predetermined percentage of each loan in its portfolio before selling the rest to other investors (banks, the

traditional source of issuance, may participate in such deals, but the due diligence and procurement are handled by the lead investor, such as a pension fund or insurance company" [9].

As investors are working much closely with the project, investment banks or banks don't need intermediaries. Usually a team of infrastructure investment is developed by these investors. Direct lending towards infrastructure projects is also considered to be a niche market in comparison to Small Medium Enterprises (SME) direct lending. As for the lender, it is very crucial to be familiar with the industry, the project itself, and also deal with underwriting, but the investors are keen to invest due to the reduced fees, and the yield.

K. Hybrid Instruments

Another form of financing is Hybrid Instruments, this is a form of financing scheme in which they share the characteristics of debt and equity instruments. Hybrid instruments may have their securities sold in the market at an exchange or a brokerage, which could give them a floating or fixed rate by interests or dividends.

Convertible Bonds

This is not the same as the usual debt instruments. Convertible Bonds have characteristics of an equity instrument, as these are used in corporate capital structures. Corporate bonds have the right of a call option included, they are less expensive for an issuer as coupon payments are offset by the conversion option's value. Investors in this case are prepared to have a lower coupon rate in exchange for having gain through share price.

"Their distinct investment profile offers downside protection, similar to that of a bond, as well as upside participation in the issuer's development through conversion to common shares" [9].

Due to their low cost and probability of share price rises, convertible bonds are a popular tool among fast growing companies.

Mezzanine Debt

Mezzanine loans are a type of debt instrument that is in between and fills the gap between debt and equity instruments, and this has the highest form of risk. Some examples of mezzanine debt are call options, rights, and warrants. Mezzanine is considered to be lower than pure debt, but it is higher than equity in terms of level. Mezzanine also behaves much more similarly to stock due to the options of debt into equity. Usually mezzanine could have much higher returns than other forms of debt.

"Mezzanine debt is a sort of privately issued subordinate loan or bond that is typically used in project finance or private equity investments. Mezzanine debt can be either interest-bearing or interest-only, and might involve a portion of the project's value increase. Payment in kind features (where debt payments are made through stock offers) are becoming more popular" [9].

Because of the increased cost and risk of capital equity, infrastructure projects could be very difficult to fund through equity, especially in areas prone to regulation changes and utilizing new technology. Furthermore, equity sponsors may be hesitant to reduce their commitment to an asset, preferring debt instruments over new stock. Mezzanine debt, initiated by public institutions such as Multilateral Development Bank (MDB), can be used to decrease the amount of equity required from more hesitant private investors, providing internal credit support for the entire project structure. Additional solvency, for example, may make the project eligible for commercial loans and investment from companies that need a certain amount of stock.

L. Indonesia Infrastructure Guarantee Fund (IIGF) / Penjaminan Infrastruktur Indonesia (PII)

A guarantee fund is a fund which could be characterized as government guarantees in minimizing risk of political influence, pushing transparency and high standards, securing assets, and ensuring independence. These funds are usually liquid assets that could be mobilized when there is a contingent liability.

IIGF, which manages infrastructure guarantee funds in Indonesia has the purpose of giving financial guarantee to obligations of the government to related contracting stakeholders in PPP with private investors. IIGF also provides a financial guarantee in the form of an agreement. Unlike the infrastructure "letter of support", which was just a unilateral and simple letter issued by the government, the current agreement is negotiated and signed by both IIGF and the investor, as well as the government if it guarantees the project with IIGF. As a result, the agreement provides a lot more information on the parties rights and duties. There is now an explicit figure for the liabilities that the state may be liable for in the case of a risk occurrence. This component was missing from the previous guarantee letter, making contingent liability harder to assess [12].

M. Greenfield and Brownfield Investment

The term greenfield investment defines the stages of a project of an investment which is categorized into the early phase of the process. Greenfield projects are generally newly held projects that are categorized in the

phases of a very early stage. This includes building new companies and entities, and starting from scratch with hiring management, human resources, and facilities. This field usually generally has risks and high cost as what would be encountered in what creating a new entity would have [6].

While for the term Brownfield investment means that they are in fully operational condition. In which, management, facility, and human resources already exist. Brownfield investments carry less risk, as it is an ongoing operational company, in which there is no speculation from the planning and predicted revenue. Brownfield investments is the perfect stage for new investors to enter the company through newly raised capital, or even through issuing bonds in the capital market [7].

N. Hypothesis

During this post-pandemic era, the Indonesian Government has several ways to reduce the weight on the APBN without sacrificing development of public transportation infrastructure projects. First of which is by implementing debt financing instruments, such as bond financing, or loan financing. This will have options of having funding from the public market through bonds, and also institutional investors for lending. This poses risk that will arise, as usually the sectors the public have interest are towards other industries other than infrastructure, as infrastructure investments are generally for the long term. The implementation of the PPP scheme will also be beneficial for the government in maintaining control over public projects while sharing the risks with private investors.

Implementing this strategy, would then reduce the burden on the APBN, thus could help private investors help develop public infrastructure in exchange for investments for them, and a future revenue stream for their businesses.

III. RESEARCH DESIGN & METHODOLOGY

The purpose of this research is to analyze and provide a proposed solution for infrastructure development funding in Indonesia based on current financing methods in comparison to creative alternative financing solutions. The result we want to achieve in this research is to provide solutions for the Indonesian Government, construction companies, investment authorities, investors, and other related stakeholders to finance projects to reduce burden on the national budget and could have less of a challenge to execute. In order to conduct research based on unbiased opinion, a method of systematic research needs to be done. This research will begin by studying existing conditions and the goal of infrastructure development

in Indonesia, and exploring possible problems that are encountered during the process. Furthermore, the research will then delve into several supporting information to support the proposition through a series of research journals and academic journal articles, and a focus group discussion interview.

O. Data Collection

In order to find the basic foundations of this research, the method that will be used is qualitative based research. This method will be a literature review conducted through reading research journals, and academic articles. Furthermore, an interview will also be conducted to provide primary data with Mr. Wisnu Wardhana, M.Sc., an Investment Manager of PT Indonesia Infrastructure Finance, a private national company under multiple international and national institutions that provides infrastructure financing and advisory services. Mr. Wardhana has first-hand experience in assessing potential deals on PPP projects, familiar with structuring project financing instruments such as debt, equity, and mezzanine debt. Furthermore, Mr. Wardhana is also involved in several deals with clients and related authorities in multiple sectors such as Renewable Energy, Port and Airports, Toll-Road, Telecommunication, Water Treatment, and Oil and Gas.

The data collected will be aimed to help aid further information first-hand from a primary source to understand the processes, and challenges in the management field, as well as past experiences of the interviewees career in infrastructure financing, and past related projects to prove the proposition of the paper.

P. Data Analysis

A comparison between multiple funding methods from different secondary data sources in the literature review will help give the foundations of the analysis for the primary data focus group discussion result. The analysis will break down several theories from the secondary data and match it with real life data to gather the facts for this paper.

IV. FINDINGS AND DISCUSSION

Q. Findings

Based on the research objectives, this paper has several findings that could be separated into 4 parts from 3 research questions: How will the Indonesian government save state budget funds during this post-pandemic era in developing public infrastructure in Indonesia, especially transportation infrastructure? What will be the most appropriate financing scheme to develop transportation Infrastructure in Indonesia? What are the factors in

deciding a proper financing scheme for transportation infrastructure in Indonesia? These research questions are defined more in depth into a series of more findings that revolve around the same matter.

Post-Pandemic Impact Towards Infrastructure Financing

Being in the post-pandemic era, when discussing the impact on COVID-19 towards the industry and infrastructure development, the interviewee has expressed the difficulty of financing activities that differs towards the pre-pandemic era in which the year 2020 and 2021 has been a major slowed down process compared to 2019. Banks and companies are waiting for leveled conditions before investing again due to the uncertainties. And as expected, the post-pandemic situation will have many constraints. For the internal process itself, the interviewee has shared that the internal process itself is not far off the pre-pandemic situation, with the economy starting to get better and better, more infrastructure projects will roll down in the list, additional new ones in the upcoming years.

Infrastructure projects have a wide field of scope in terms of the projects, but for this case the interviewee has stated that each project has different risk and returns. When comparing toll-road projects, railway, and water treatment, a toll-road will give a lower rate of return than others, despite the fact that their tenor is longer than railways and water dams. However, toll roads have some success story projects, so there is already a sample which is successful on the projects, so some firms believe that this project has lower risk than railway and water treatments, as railways in Indonesia still only have one success story for non-fully funded government projects.

Methods of Financing and Schemes

Indeed for infrastructure projects, there are many kinds of financing instruments, as discussed before in the topic of the likes of equity and debt instruments and also hybrid ones too. The interviewee said that for the most common ones are debt instruments, namely senior term loans, because few institutions can provide equity financing or equity investment. Banks can only provide senior term loans, with the exception of Indonesia Infrastructure Finance, which can provide equity investment through Sarana Multi Infrastruktur. The process for senior term loans would be in general, a corporation will apply to the bank if they have a project that they will discuss, for example a railway project with a tenor of ten years could use different set of schemes such as A, B, and C, and the bank will examine the viability of the project. But this comes with constraints;

"Actually in the bank itself, what we called 'normal banks',

the problem for the bank especially in terms of financing tenor, because for the infrastructure project they required longer tenor more than 10 years, so not many banks can finance more than 10 years actually, like for the projects, they usually required 15 years for financing tenors, maybe other project they required 20 years, and not many banks can provide longer tenor periods. This is maybe one of the constraints. Secondly, it is about the pressing itself, currently during the pandemic, the Central Bank of Indonesia decreased its reference rate, with the decrease in reference rate, so the all in rate for the project is low for the bank, maybe below 8% per annum. so not many bank can afford this kind of pricing, only big Indonesian banks like Bank Mandiri, Bank Rakyat Indonesia, or Bank Central Asia could achieve this kind of project, and the project finance itself normally they will arrange syndication, so can only give finance by one single bank, so it is difficult for some banks to find any participants for the financing project and there is constraint in the mission before like financing tenor, or interest rate is low." [16]

There are also some other options for financing as mentioned by the interviewee, however it is not as easy or as fast as bank loans. Companies can go to the capital market by issuing bonds, such as project bonds, but for SPV companies that are currently developing greenfield projects, it would be difficult to find investors willing to buy these project bonds unless the project is already an ongoing operational and generating revenue company. There is also a possibility of another type of investor that the interviewee mentioned, that is through angel investors, who wish to fund equity through direct equity participation. However, finding investors for infrastructure projects would be a challenge. Even for SOEs, they prefer not to wish to fund the entire project themselves.

For PPP itself, it is used as the scheme for the project itself, but debt financing, equity financing, or a combination of equity and debt financing are the most common ways to fund a project. Another usual practice, the interviewee said was blending loan and equity with a debt-to-equity ratio of 70 percent debt and 30 percent equity from the project owner. So the PPP is basically the government's method for supporting these initiatives by designating them as PPPs, allowing the government to give incentives.

Indonesian Government Support

There are several government supports that are given through incentives. The interviewee refers to it as a government guarantee since it is implemented on the Trans-Sumatra Toll Road. So, in the event that the project business fails to return the banks to the lenders, the government will top up funds the project firm, which is what is referred to as a government guarantee. This is one of the government's most secure incentives. Government

guarantees are normally obtained directly from the MoF.

The second type of payment is called availability payment (AP). This AP is provided to projects that may have so-called project companies that do not need to consider the project's traffic demand, such as railways, which do not have the need to calculate the railway's traffic. As long as they meet the government's KPI, they will be paid with the amount already stated on the concession agreement, with the fixed amount stated in the concession agreement.

The third instance is the Viability Gap Fund (VGF), or viability gap fund, as it is known. For example, there's a 10 kilometer toll road project, it could be 6 kilometers built by the corporation and 4 kilometers funded by the state budget. However, despite the government's construction of 4 kilometers, the project company could still get money from the 10 kilometers, and the corporation may receive revenue from the entire toll road.

The final is the IIGF guarantee, which provides some safety to the banks and lenders in the event that the government fails to pay the project business; IIGF will guarantee the government payment:

"So for the government there are two conditions, first is because IIGF also acts as the arranger of the PPP project, so they are involved in the preparation of the project, from the start. So if IIGF is involved in the preparation of the project, this is what we call a solicited project. So IIGF will provide a guarantee, because they already know about the project they know that this project needs guarantee from IIGF for or to be feasible for the banks, so they will start from zero. The second type is what we call unsolicited projects, so these unsolicited projects are actually already feasible from the beginning, but if the project company wants to apply for a guarantee from IIGF, they can apply to IIGF. Gives additional comfort" [16].

An Attractive Infrastructure Project for Financiers

When asked about what makes an infrastructure project stand out in Indonesia for investors, the interviewee tends to say that it depends on the future revenue stream and how likely in the future it would produce from its revenue streams. For the IIF, because of their obligation, they must fund this sector because IIF is limited to infrastructure projects. However, the interviewee believes that one of the main reasons for banks to finance these projects is that they have a dedicated future revenue stream from the project. For example, if an investor finances a toll road, investors already know that they will have dedicated revenue from traffic for the next 15 years, so the sustainability of a so-called sustainable revenue is becoming more important to banks when financing infrastructure projects. The interviewee has also stated

several finance factors that will influence the decision making process;

"Actually in terms of interest rate and the rate of return, some of the projects such as toll road projects have maybe lower rate of return as compared to other sectors. So if we so called, see only from the return perspective, some of the projects are not as attractive as compared to other projects such as manufacturing or trading, but on the other hand, like manufacturing and trading, this sector is so called, we call it a short term investment but for infrastructure it will be a long term investment, it will increase the bank asset in the long term" [16].

It is clear from a broad view that most generally investors are interested in long term goals of an asset, which also will not be as attractive in investing in other sectors. The interviewee also addressed that for national strategic projects (PSN) in Indonesia gives more attractiveness. Since the project is under the government, there are a lot of incentives for it, such as insurance from the IIGF and some kind of equity payment, so this kind of availability payment the project didn't have anything to do with traffic demand or anything like that. As a result, throughout the financing term, also known as the concession period, the revenue is already set. As a result, lenders are more interested in this type of national strategic initiative since the risks are smaller than in a typical project. Because, in the end, banks will look at the project's risk, and if the risk is lower, they will favor the lower risk project over the high risk initiative.

R. Discussion

From the overall result, we could discuss several points that will help answer the following research questions; How will the Indonesian government save state budget funds during this post-pandemic era in developing public infrastructure in Indonesia, especially transportation infrastructure? What will be the most appropriate financing scheme to develop transportation Infrastructure in Indonesia? What are the factors in deciding a proper financing scheme for transportation infrastructure in Indonesia?

The result indicates that the post-pandemic era has definitely changed the way the Indonesian government helps finance infrastructure financing, especially transportation infrastructure. But with the recent progress of the 'new normal' has brought light into the situation in giving a positive outlook. With the normal interest rate from Jakarta Interbank Offered Rate (JIBOR) around 4%, the next 1-2 years will recover Indonesia into the normal pre-pandemic era. Hence this will move banks from waiting for the conditions, into having more interest towards the infrastructure projects, which will attract more banks into investing.

Reference [16] claims that in Indonesia, toll-roads would be the most preferable option for infrastructure financing than railways, as there are more success story projects in Indonesia. This makes direct equity investments from an angel investor and a firm highly unlikely for transportation infrastructure projects. Debt instruments especially loans are more preferable with a high chance of success depending on the factors. Reference [16] stated projects are more feasible and accessible to bank loans with the improving state of interest rates in Indonesia, and also with lower traffic during the pandemic, revenue returns are hard to be dependent on if there is an equity investment.

In line with the results, Reference [16] mentioned the project stages has also an influence on the decision making for choosing a financial instrument. As the greenfield stage is more appropriate to use debt instruments such as bank loans/lending and also a mixture of debt and equity through PPP of 70/30 ratio. There is an exception for brownfield projects that already generate revenue which will have options of refinancing of using equity instruments such as an Initial Public Offering (IPO) debt instruments of bonds, bank loans too, and also even through hybrid instruments.

Being lending as the highly supported instrument for developing transportation infrastructure, a form scheme to support is needed to be a PPP. As this is a way of government support for allowing private firms to reduce their risk. The PPP will also help the lending process to be more achievable, as according to the interviewee, the government will provide incentives such as government guarantees, a VGF, and also AP. This data contributes to a clearer understanding of the factors in influencing the financing scheme. As the PPP scheme will be the most beneficial for relevant stakeholders.

From the project itself, the factors will be overseen through the expected return from future revenue streams of the project, which in this case, for transportation infrastructure will be important to lenders such as banks to have additional comfort from having sustainable revenue, which will make the decision making faster for lending. As focused on long term investments, transportation infrastructure is chosen to be an attractive lending opportunity as it is part for lenders in having long-term assets, and also being part of a PSN project from the Indonesian Government means having less risk to deal with.

Although this has answered the research question, there are limitations in finding data regarding how efficient is using certain types of financing in this research with the data, as there is a lack of data available regarding the comparison of returns from in between financing methods and also between project sectors in the infrastructure industry. As different returns might also change the decision making

process of choosing a financing instrument based on the statements stated before. Further research quantitatively from a revenue comparison point of view could help define and prove answering efficiency of each financing method.

V. CONCLUSION

This research aims to analyze the most appropriate financing scheme for developing public transportation infrastructure in Indonesia through looking at several factors in the decision making process. After analyzing the process of how a public infrastructure gets financing outside from the state budget through an interview with one of the stakeholder, in this case from IIF, has shown how decision making is applied from the concepts of financing instruments by comparing several instruments and relating it with the existing factors of a project to oversee the most appropriate method.

Based on a qualitative analysis of an interview as well as supporting sources from journals and research, it can be concluded that there could be recommendations methods of financing scheme for the Indonesian Government to help develop public infrastructure as well as focusing on saving the APBN as seen from several factors such as: stages of the project; future sustainable revenue stream; project's investment return; JIBOR interest rate; and either it is categorized as PSN or not. The appropriate one would be through the PPP financing scheme. As this is perfect for the government to have within reach control of the project itself by helping as supervisors and let the private firms handle operation and construction. This will have the project be under a new entity that will have both stakeholders of a private company and also a government entity. This project could be funded in a mix of debt and equity ratio of having debt funded and also equity funded from the private firm. The project would then be financed again by debt instruments, in this case would be by financing through bank loans, direct lending and also sukuk. This method is efficient for planned public transportation infrastructures as they have no ongoing revenue stream and are still on the greenfield stage.

As developing public transportation infrastructure is key in Indonesia's development, it would be a public need, with the right planning, there will be a dedicated future revenue stream for the long term that will benefit financers and also investors through daily ridership. The combination of PPP scheme, debt-to-equity financing, and debt instruments will help the start of these greenfield projects which then reduce the weight on the Indonesian APBN. In this post-pandemic era, the APBN could then be restructured to focus more on healthcare, without sacrificing construction on public transportation infrastructure.

As transportation projects could be categorized into

PSN, government incentives could also help through the proposed PPP, debt-to-equity financing, and debt instruments scheme. With a project categorized as PSN, specific government guarantee will help if the project fails to return the sum amount of loan to the lenders in the amount of time agreed before in the contract.

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Paper 35

Optimal Capital Structure of PT Adhi Karya (Persero) Tbk

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Abstract - PT Adhi Karya Tbk proposed additional equity to the government in the form of Penyertaan Modal Negara (PMN) for 1.98 trillion IDR and plans to issue rights for 1.89 trillion IDR. However, the current capital structure of the firm consists of 40% debt and 60% equity while the construction industry's average is 57% and 43% respectively. Meaning, if the firm receives the additional equity, its capital structure will deviate from the industry. Based on the problem, it has to be analyzed whether the additional equity for PT Adhi Karya Tbk is aligned with its optimal capital structure. Therefore, the firm can have the lowest cost of capital and maximize the firm's value. For the methodology, this research uses capital asset pricing model, Damodaran (2015) cost of debt model, and weighted average cost of capital. Based on the data analysis, the optimal capital structure of PT Adhi Karya Tbk consists of 27% long-term debt and 73% equity with cost of capital 14.526%. The firm has to decrease its additional equity and increase debt by issuing bonds or bank loans.

Keywords – Adhi Karya, Industry Average, Optimal Capital Structure

I. INTRODUCTION

Construction industry significantly contributes to the development process of both developing and developed countries. Based on Badan Pusat Statistik (BPS), the GDP of the construction industry in Indonesia on the basis of current price (Atas Dasar Harga Berlaku-ADHB) contributes 10.44% to the national GDP in 2021. The contribution is the fourth highest after industrial processing (19.25%), agriculture (13.28%), and wholesale and retail trade (12.97%). This industry grew 2.81% in 2021 to 1.1 quadrillion IDR from 2020 [1].

Indonesia Government plans to give investment in the form of Penyertaan Modal Negara (PMN) to some of the SOEs in 2022 with the total amount of 38.50 trillion IDR. The aim is to support the development of infrastructures and buildings to increase national competitiveness and welfare through SOEs projects [2]. One of the SOEs that will receive PMN from the government is PT Adhi Karya Tbk. This government action obviously will affect the capital structure of the firm.

PT Adhi Karya Tbk is one of the largest state-owned construction companies in Indonesia. This company

was determined as a state-owned company along with the merger with the former Dutch-owned construction company called Associate NV based on the Government Regulation no. 65 in 1961. On March 18th, 2004, PT Adhi Karya made its first Initial Public Offering (IPO) with the issuer code ADHI that was listed in Indonesia Stock Exchange (IDX). The ultimate shareholder of the firm is the Government of Indonesia at 51% of the total number of shares and the rest of it is owned by the public which are each below 5%. PT Adhi Karya Tbk now has control on several subsidiaries, including PT Adhi Persada Properti, PT Adhi Persada Beton, PT Adhi Persada Gedung, PT Adhi Commuter Properti, PT Dumai Tirta Persada, and PT Jalintim Adhi Abipraya. The scope of business of PT Adhi Karya Tbk includes construction, engineering procurement and construction, implementation of railway infrastructure, investment, general trading, procurement services, manufacturing (precast) services in information technology, real estate, agro-industry, property, and hotel. PT Adhi Karya Tbk earns taxable and non-taxable income from these business lines due to the final-tax and non-final tax terms that is applied in Indonesia. Based on the annual report of 2021, PT Adhi Karya Tbk has 2.85 trillion IDR of taxable income and 8.68 trillion IDR of non-taxable income [3]. Meaning, PT Adhi Karya Tbk still gets the tax benefit from the interest expense that is associated with the proportion of taxable income.

In order to support the firm's project operations and performance in 2022, PT Adhi Karya Tbk proposed PMN to the government to increase their equity capital by the amount of 1.98 trillion IDR. The company will allocate the money for several project investments. To avoid the dilution effect to the existing shareholders, the firm and the shareholders decided to also issue rights by the amount of 1.89 trillion IDR. Thus, the total amount of additional equity the firm will receive is 3.87 trillion IDR [4].

Based on the PT Adhi Karya Tbk's annual report in 2021 [3], the capital structure of the company currently consists of the total amount of long-term debt of 2.17 trillion IDR and equity of 3.19 trillion IDR. In other words, PT Adhi Karya Tbk's capital structure consists of 40% of long-term debt and 60% of equity with a long-term debt-to-equity ratio of 67%. Meanwhile, referring to the big 4 construction SOEs in Indonesia which are PT Waskita Karya Tbk, PT Wijaya Karya Tbk, PT Adhi Karya Tbk, and PT Pembangunan Perumahan Tbk, the industry's long-term debt and equity on average is 57% and 43% respectively

with long-term debt-to-equity ratio on average is 154%. By that, if PT Adhi Karya Tbk receives PMN and issues rights, its equity proportion will be considerably larger, while its debt proportion will be substantially lower than the industry average. In other words, the capital structure of PT Adhi Karya Tbk will deviate from the average industry. According to Patel, Zeckhauser, and Hendricks (1991) there is a behavioral perspective that sees industry average as the safety number for a company to follow. This statement is called herd migration which explains birds that travel in groups feel more common [5]. Although capital structure in the industry average has no guarantee that it is at the optimal level, Damodaran (2015) stated that it is far too strong to be ignored [6].

The starting point of modern capital structure theory was M&M Theory, created by Modigliani and Miller in 1958. In M&M's first proposition, it advocates the irrelevance of capital structure in terms of perfect market conditions, which are no tax, transaction cost, bankruptcy cost, and all information is symmetrically available. In other words, there is no difference between unlevered and levered firm in terms of firm's value. However, these assumptions are unrealistic to the real world. In reality, tax exists and adds benefit from debt capital that can lower the cost of capital. By that, Modigliani and Miller proposed a second theory that added the effect of tax which the benefit can minimize the cost of capital [7]. Therefore, identifying optimal capital structure is relevant to maximize the value of a firm.

The optimal capital structure can be reached with the minimum cost of capital. There are two sources of financing of a firm, which are debt and equity. Issuing debt capital creates a cost of debt which is the cost in borrowing the funds to the bondholders for project financing. On the other hand, shareholders that invest in the firm's equity capital require a rate of return to compensate for the risk they bear called cost of equity. The cost of debt is cheaper than the cost of equity because there is a tax shield and bondholders bear less risk than shareholders by having a priority to be paid first. By minimizing these two costs, the firm will reach the lowest level of cost of capital which can lead to the optimal capital structure of the firm, so the firm value will be maximized [6]. These statements are in accordance with Trade-off Theory, which explains that optimal capital structure is reached by trading off the cost and benefit of debt [8].

Based on the problem stated previously, the author decides to make further review regarding the capital structure of PT Adhi Karya Tbk. In 2022, the company will receive PMN from The Ministry of SOE for the amount of 1.98 trillion IDR and issue rights for the amount of 1.89 trillion IDR that will deviate its capital structure from the industry average. Moreover, the debt proportion of PT

Adhi Karya Tbk, which is lower than the industry, also needs to be analyzed, whether the firm needs to increase the debt to the same level of industry or not. At first, the author needs to find the optimal capital structure for PT Adhi Karya Tbk. Furthermore, if the additional equity from PMN and right issues do not support the optimal mix of debt and equity of PT Adhi Karya Tbk, a feasible strategy needs to be stated for PT Adhi Karya Tbk to reach the optimal capital structure. Thus, PT Adhi Karya Tbk can maximize the value of the firm.

II. METHODOLOGY

There are two steps of analyzing the data in order to achieve the research objectives, which are calculating the current and optimal capital structure of the firm and finding the strategy that should be taken regarding the additional equity to reach the optimal capital structure. In calculating the capital structure, both current and optimal, the author will use capital asset pricing model (CAPM) for cost of equity, Damodaran Cost of Debt Model for cost of debt, and Weighted Average Cost of Capital (WACC) for the cost of capital.

A. Cost of Equity

In order to calculate the cost of equity, CAPM can be used. CAPM accounts beta as non-diversifiable risk in portfolio assets [9]. Below is the equation of cost of equity using this method:

$$\text{Cost of Equity } (r_e) = R_f + \beta_{levered} \times [E(R_m) - R_f] \quad (1)$$

Means,

R_f = risk-free rate

$\beta_{levered}$ = Levered beta

R_m = Market return

In order to find the levered beta for the calculation of cost of equity using CAPM, beta and unlevered beta have to be calculated first. The beta in this calculation is estimated by Linear Regression Slope Model using ADHI and JKSE stock return historical data for a 3 years time horizon (2019-2021) on a weekly basis. Afterwards, the regression beta is being unlevered to see the volatility of the return without the financial leverage. The tax associated with debt for PT Adhi Karya Tbk should be adjusted by multiplying it to the proportion of taxable earning to account for the amount of tax benefit the firm able to claim, including for the beta calculation. Below is the equation of unlevered beta:

$$\text{Unlevered Beta } (\beta_u) = \frac{\text{Regression Beta}}{\left[1 + \left(1 - \left(T \times \frac{Et}{Et+Ent}\right)\right) \times \frac{LD}{E}\right]} \quad (2)$$

Means,

T = Corporate tax rate

LD = Total long-term debt

E = Total equity

Et = Taxable earnings

Ent = Non-taxable earnings

After finding unlevered beta, the beta is being re-levered to account for the effect of leverage in each debt level which the formula as follows:

$$\text{Levered Beta } (\beta_l) = \beta_u \times \left[1 + \left[1 - \left(T \times \frac{Et}{Et+Ent}\right)\right] \times \frac{LD}{E}\right] \quad (3)$$

Means,

T = Corporate tax rate

LD = Total long-term debt

E = Total equity

Et = Taxable earnings

Ent = Non-taxable earnings

B. Cost of Debt

Damodaran divides companies into two categories based on the market capitalization for determining the Synthetic Rating Spread Table that will be used, which are large firms with more than 5 billion USD and small firms with less than 5 billion USD market capitalization. Thus, the calculation of the firm's market capitalization is required first. Below is the formula of market capitalization [6]:

$$\text{Market Capitalization} = \text{Current Share Price} \times \text{Total Shares Outstanding} \quad (4)$$

Damodaran made a Synthetic Rating Spread to estimate the cost of debt by the default spread that is obtained by the value of the firm's interest coverage ratio [10]. Below is the equation to calculate interest coverage ratio:

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Interest Expense}} \quad (5)$$

After calculating the firm's interest coverage ratio, both the synthetic rating and the default spread of the firm can be determined by seeing the Damodaran Synthetic Rating Table below. Since PT Adhi Karya Tbk is categorized as a small firm based on its market capitalization, the table below belongs to the firms that have market capitalization below 5 billion USD:

Table 1 - SYNTHETIC RATINGS FOR COMPANIES WITH MARKET CAPITALIZATION <\$5B

If interest coverage ratio is

Greater Than	Less than or equal	Rating	Spread
12.5	100000	Aaa/AAA	0.67%
9.5	12.5	Aa2/AA	0.82%
7.5	9.5	A1/A+	1.03%
6	7.5	A2/A	1.14%
4.5	6.0	A3/A-	1.29%
4	4.5	Baa2/BBB	1.59%
3.5	4.0	Ba1/BB+	1.93%
3	3.5	Ba2/BB	2.15%
2.5	3.0	B1/B+	3.15%
2	2.5	B2/B	3.78%
1.5	2.0	B3/B-	4.62%
1.25	1.5	Caa/CCC	7.78%
0.8	1.2	Ca2/CC	8.80%
0.5	0.8	C2/C	10.76%
-100000	0.5	D2/D	14.34%

After knowing the default spread, the risk-free rate is added in order to get the pre-tax cost of debt which the equation as follows:

$$\text{Pre - Tax Cost of Debt } (r_d) = \text{Risk - free Rate} + \text{Default Spread} \quad (6)$$

Cost of debt creates tax savings from the interest payment. Therefore, the after-tax cost of debt needs to be calculated to account the benefit effect of the tax rate into the firm's cost of debt [9]. Construction industry in Indonesia bears final tax, which means the tax is deducted directly from the revenue and does not create any tax savings. However, in this case, PT Adhi Karya Tbk as a construction company has both final and non-final tax to deduct since the firm also has a minority percentage of other business lines that bears non-final tax (taxable earning). In regards to this situation, the corporate tax rate has to be adjusted by multiplying it to the proportion of taxable earnings to reflect the tax benefit. Thus, the equation of after-tax cost of debt will be:

$$\text{After - tax Cost of Debt} = r_d \times \left[1 - \left(T \times \frac{Et}{Et+Ent}\right)\right] \quad (7)$$

Means,

r_d = Pre-tax cost of debt

T = Corporate tax rate

Et = Taxable earnings

Ent = Non-taxable earnings

C. Weight of Equity and Debt

- o Weight of Equity

Weight of equity is the percentage of equity within the firm's capital structure. The market value of equity can be determined by market capitalization using (4) because it shows the market value of common stock equity [6]. The

firm's weight of equity can be found within this equation:

$$\text{Weight of Equity } (W_e) = \frac{\text{Total Equity}}{\text{Total Capital}} \quad (8)$$

o Weight of Debt

For the value of debt in this research, the market value of the bonds and the book value of the bank loans are used as the interest-bearing long-term debt. Market value of debt is difficult to calculate since only few firms have all debt in the form of bonds outstanding trading in the market [6], that is the reason the bond loan is obtained by book value. The weight of debt can be calculated using formula below:

$$\text{Weight of Debt } (W_d) = \frac{\text{Total Long-Term Debt}}{\text{Total Capital}} \quad (9)$$

D. Cost of Capital

WACC calculation is a method to find the current and optimal cost of capital. The variables that are used are cost of debt, cost of equity, and weight of debt and equity [9]. There is no preferred stock in PT Adhi Karya Tbk's capital. Previously mentioned, the corporate tax rate of PT Adhi Karya Tbk for the cost of debt has to be adjusted by the proportion of taxable earnings to capture the tax benefit of the firm. Therefore, the equation of WACC for PT Adhi Karya Tbk will be:

$$WACC = W_d \times \left[r_d \times \left[1 - \left(T \times \frac{Et}{Et+Ent} \right) \right] \right] + (W_e \times r_e) \quad (10)$$

III. RESULTS

A. Key Assumptions

An assumption for several variables needs to be made as a basis for the entire calculation of PT Adhi Karya Tbk's capital structure. Below are the variables:

1. Risk-Free Rate

The author used Indonesia's 10 years government bond yield to maturity for the risk-free rate which is 6.38%. It is because according to Damodaran, long-term government bond has riskless asset due to the low to zero probability of default and it is the most common used for corporate finance [6].

2. Market Risk Premium

The author generated market risk premium by finding market return (JKSE) then subtracting the risk-free rate, resulting in 5.18% risk premium. The market return is obtained by compounded annual growth rate (CAGR) as geometric return from 1991-2021. The geometric return is used to get expected return over long periods which is

suitable for capital structure that associated with long-term investment [6]. The author used 30 years time horizon to get the maximum reduction of standard error of risk premium [6].

3. Corporate Tax Rate

The author used 19% corporate tax rate. It is according to the annual report of PT Adhi Karya Tbk in 2021.

4. PT Adhi Karya Tbk's Beta

The author used linear regression counting using ADHI against JKSE stock return to calculate PT Adhi Karya Tbk's beta [9], resulting in 2.59. Within the calculation, the author used 3 years time horizon (2019-2021) to minimize the standar error [11] and on weekly basis to get more stable result [12].

B. Current Capital Structure

1. Current Cost of Equity

The variables needed for the calculation are risk-free rate, market return, and beta of PT Adhi Karya Tbk to calculate cost of equity using (1). The risk-free rate is 6.38% from the yield-to-maturity of a 10 years government bond. Meanwhile, the market return is found by Compounded Annual Growth Rate method from Jakarta Composite Index (JKSE) stock return from 1991 to 2021 which results in 11.68%. Thus, subtracting the market return to the risk-free rate, the market risk premium will be 5.18%. On the other hand, the beta of PT Adhi Karya Tbk is the slope obtained by linear regression method. Therefore, the calculation of the cost of equity is:

$$\begin{aligned} \text{Cost of Equity } (r_e) &= 6.38\% + 2.59 \times (11.56\% - 6.38\%) \\ &= 19.79\% \end{aligned}$$

2. Current Cost of Debt

The ratings from PT Pefindo in PT Adhi Karya Tbk annual report of 2021 is A-. Thus, based on the Damodaran Synthetic Rating Spread Table (see Table 1) the default spread for A- is 1.29%. Adding up the risk-free rate, the firm's current cost of debt is 7.67% using the Damodaran Cost of Debt Model. The calculation as follows using (6)

$$\begin{aligned} r_d &= 6.38\% + 1.29\% \\ r_d &= 7.67\% \end{aligned}$$

Following the Damodaran method, the second iteration is needed to assure the number of the cost of debt that has been calculated before is appropriate already. Firstly, the amount of interest expense is obtained by multiplying the total debt to the the prior calculated cost of debt.

$$\begin{aligned} \text{Interest Expense} &= 2,150,390,880,639 \times 7.67\% \\ &= 164,848,964,910 \end{aligned}$$

After that, the firm's Earning Before Interest and Tax (EBIT) is divided with that amount of interest expense to get an interest coverage ratio using (5). Then, looking at the Damodaran Synthetic Rating Spread Table (Table 1), the company default spread can be determined based on the value of interest coverage ratio.

$$\text{Interest Coverage Ratio} = \frac{1,307,568,303,103}{164,848,964,910} = 7.93$$

From the amount of 7.93 interest coverage ratio, it can be seen from the table (see Table 1) that the company's default spread is 1.03%. Finally, the cost of debt is counted by summing up the risk-free rate and the default spread. Below is the calculation for cost of debt in the second iteration using (6)

$$r_d = 6.38\% + 1.03\% \\ r_d = 7.41\%$$

Since the value of cost of debt in the second iteration is different from the first one, the third iteration is needed to obtain. The steps are the same with the second iteration. The interest expense is obtained by multiplying the firm's total debt with the cost of debt in the second iteration.

$$\text{Interest Expense} = 2,150,390,880,639 \times 7.41\% \\ = 159,257,948,620$$

Then, we find the interest coverage ratio by dividing EBIT that is multiplied to the interest expense using (5) which results in 8.21.

$$\text{Interest Coverage Ratio} = \frac{1,307,568,303,103}{159,257,948,620} = 8.21$$

By knowing that, the company default spread can be found by looking at the Damodaran Synthetic Rating Spread Table (see Table 1), which results in 1.03%. By adding up the risk-free rate, below is the result of the third iteration of cost of debt using (6)

$$r_d = 6.38\% + 1.03\% \\ r_d = 7.41\%$$

As the result is the same with the second iteration, it can be concluded that the current cost of debt of PT Adhi Karya Tbk is 7.41%. After knowing the cost of debt, the effect of tax needs to be included. Thus, the next step is to find the after-tax cost of debt by multiplying the cost of debt to (1 - Tax Rate). The tax used in this calculation is the marginal tax rate that is applied to PT Adhi Karya Tbk in 2021, which is 19%. However, as PT Adhi Karya Tbk has both non-taxable earnings and taxable earnings due to final-tax and non-final tax terms, the tax has to be

multiplied to the proportion of taxable earnings to reflect the amount of tax benefit. The calculation of the firm's current after-tax cost of debt can be seen as follows using (7):

After – Tax Cost of Debt

$$= 7.41\% \times \left[1 - \left(19\% \times \frac{2,848,777,265,003}{11,530,471,713,036} \right) \right]$$

$$\text{After – Tax Cost of Debt} = 7.06\%$$

3. Current Weight of Equity and Debt

o Weight of Equity

The weight of equity is obtained by dividing the market value of equity to the total capital of a firm. Using (8) the result will be:

$$\text{Weight of Equity} = \frac{3,186,960,191,520}{5,337,351,072,159} \times 100\% \\ = 60\%$$

o Weight of Debt

The weight of debt is calculated by dividing the firm's total interest-bearing long-term debt to the total capital, which shown in the calculation below using (9)

$$\text{Weight of Debt} = \frac{2,150,390,880,639}{5,337,351,072,159} \times 100\% \\ = 40\%$$

4. Current Cost of Capital

After generating the firm's current cost of debt, cost of equity, and weight of debt and equity, the current cost of capital value can be obtained by using (10). The calculation can be seen as below:

$$\text{WACC} = (40\% \times \left[7.41\% \times \left[1 - \left(19\% \times \frac{2,848,777,265,003}{11,530,471,713,036} \right) \right] \right] \\ + (60\% \times 19.79\%)) \\ \text{WACC} = 14.66\%$$

C. Optimal Capital Structure of PT Adhi Karya

1. Optimal Cost of Equity

The optimal cost of equity will be calculated using CAPM, from the debt level of 0% to 90% in 10% margin as the scenario. However, it is required to find the unlevered beta first to be re-levered for every debt level. Using (2) the unlevered beta will be:

$$\begin{aligned} & \text{Unlevered Beta } (\beta_u) \\ & \quad 2.59 \\ = & \left[\frac{1 + \left[1 - \left(19\% \times \frac{2,848,777,265,003}{11,530,471,713,036} \right) \right]}{\left(1 - \left(19\% \times \frac{2,150,390,880,639}{3,186,960,191,520} \right) \right)} \right] \end{aligned}$$

$$\text{Unlevered Beta } (\beta_u) = 1.58$$

The beta used in the formula above is obtained by linear regression beta in 3 years time horizon on a weekly basis. Meanwhile, for the tax, it is still necessary to multiply the corporate tax by the proportion of taxable income since it reflects interest expense's tax benefits.

After generating unlevered beta, it has to be re-levered for each debt level using (3). Taking 10% debt level to be calculated, the levered beta will be:

$$\text{Levered Beta } (\beta_l)$$

$$\begin{aligned} & = 1.58 \times \left[1 \right. \\ & \quad \left. + \left[1 - \left(19\% \times \frac{2,848,777,265,003}{11,530,471,713,036} \right) \right] \times \frac{10\%}{90\%} \right] = 1.74 \end{aligned}$$

As the debt level rises, the levered beta rises with it, as the risk of borrowing more money is represented by levered beta. Below is the calculation of CAPM using (1) for each debt level in 10% margin:

Table 2 - OPTIMAL COST OF THE EQUITY (10%)

Debt Level	Tax (Taxable Income)	Levered Beta	Cost of Equity
0%	4.69%	1.58	14.54%
10%	4.69%	1.74	15.40%
20%	4.69%	1.95	16.48%
30%	4.69%	2.22	17.87%
40%	4.69%	2.58	19.72%
50%	4.69%	3.08	22.32%
60%	4.69%	3.83	26.21%
70%	4.69%	5.08	32.69%
80%	4.69%	7.58	45.65%
90%	4.69%	15.09	84.55%

90% 4.69% 15.09 84.55%

From the table above, it can be seen that the cost of equity is rising as the debt level increases. It is a reflection of the fact that shareholders require higher compensation in exchange for taking on more risk since the company borrows more money from bondholders or creditors. Thus, the higher the company's debt, the higher the cost of equity it must pay.

2. Optimal Cost of Debt

The Damodaran Cost of Debt Model is used to calculate the optimal cost of debt. The steps are similar to the

calculation of the current cost of debt. First of all, each debt level is multiplied by the total capital to earn the total debt. Afterwards, the interest coverage ratio must be found in order to obtain the synthetic rating and the default spread from the table (see Table 1).

The Damodaran Cost of Debt Model is used to calculate the optimal cost of debt. The steps are similar to the calculation of the current cost of debt. First of all, each debt level is multiplied by the total capital to earn the total debt. Afterwards, the interest coverage ratio must be found in order to obtain the synthetic rating and the default spread from the table (see Table 1). Starting from 0% debt level, there is no interest expense which results in a highest synthetic rating of AAA and a lowest default spread of 0.67% (see Table 1). Then, the risk-free rate (6.38%) is added to the default spread, resulting in 7.05% cost of debt. This cost of debt number will be used to find the interest expense in the next debt level, 10% debt, by multiplying it to the total debt in 10% level of debt. The previous cost of debt is used as the interest rate in the next debt level as a notion since we do not have the actual interest rate for this debt level. Afterwards, interest coverage ratio can be obtained by dividing the EBIT to that amount of interest expense. The interest coverage ratio in the 10% debt level is 34.77, generating a rating of AAA and 0.67% of default spread. Adding the risk-free rate to the default spread, the cost of debt in the 10% debt level is 7.05%. Since the value is the same as the 0% debt level, it means that the number of the cost of debt is appropriate. However, there will be a case that the certain debt level's cost of debt turns to be different with the previous cost of debt. In this case, the second iteration needs to be obtained to assure that the cost of debt in the first iteration is already in the appropriate number. If the second iteration results in a different number from the first one, then the third iteration is required. In this calculation, 30% debt level shows different number from 20% debt level. Thus, the second iteration of the 30% debt level needs to be obtained by first finding the interest expense by multiplying the cost of debt in its first iteration to the 30% level of total debt. Then the steps mentioned before are applied again to generate the cost of debt for the second iteration. If the result is the same with the first iteration, then it is an appropriate number of the cost of debt for that debt level and the cost of debt at the next debt level can be calculated. All these steps are repeated until the 90% debt level.

After calculating all the cost of debt from 0% until 90% level of debt, the effect of tax has to be accounted for to value its benefits in each debt level. The tax rate of PT Adhi Karya Tbk for calculating the cost of debt is 4.69% since the corporate tax rate (19%) has to be multiplied by the proportion of its taxable earnings due to the existence of both final and non-final tax terms within the

firm's overall income. Using (7) the after-tax cost of debt can be determined. The value will be lower than the pre-tax cost of debt due to the tax benefit. The summarized calculation of each debt level can be seen as the following table:

Table 3 - OPTIMAL COST DEBT (10%)

Debt Level	Interest Coverage Ratio	Default Spread	Pre-Tax Cost of Debt	After-Tax Cost of Debt
0%	10,000	0.67%	7.05%	6.72%
10%	34.77	0.67%	7.05%	6.72%
20%	17.38	0.67%	7.05%	6.72%
30%	11.35	0.82%	7.20%	6.86%
40%	8.27	1.03%	7.41%	7.06%
50%	6.52	1.14%	7.52%	7.16%
60%	5.33	1.29%	7.67%	7.31%
70%	4.57	1.29%	7.67%	7.31%
80%	3.69	1.93%	8.31%	7.92%
90%	3.19	2.15%	8.53%	8.13%

3. Optimal Capital Structure

After generating the cost of debt and cost of equity in each level of debt, the cost of capital can be estimated. The cost of capital will be calculated using (10) the WACC method. Below is the calculation for cost of capital in 10% debt level margin:

Table 4 - OPTIMAL COST OF CAPITAL (10%)

Debt Level	Pre-Tax Cost of Debt	After-Tax Cost of Debt	Cost of Equity	Cost of Capital
0%	7.05%	6.72%	14.54%	14.538%
10%	7.05%	6.72%	15.40%	14.534%
20%	7.05%	6.72%	16.48%	14.529%
30%	7.20%	6.86%	17.87%	14.568%
40%	7.41%	7.06%	19.72%	14.658%
50%	7.52%	7.16%	22.32%	14.740%
60%	7.67%	7.31%	26.21%	14.866%
70%	7.67%	7.31%	32.69%	14.921%
80%	8.31%	7.92%	45.65%	15.464%
90%	8.53%	8.13%	84.55%	15.768%

From the calculation above, the lowest cost of capital of PT Adhi Karya Tbk is in the range of 20% to 30% debt level. Although it seems like the cost of capital in 30% debt level is higher than 10%, the cost of capital is still decreasing after 20% debt level in 1% margin, making the lowest cost of capital is within the range of 20% to 30% debt level. It reflects that the corporation will gain from debt only until a specific level of debt is reached, at which point the benefit equals the cost, as discussed in the Trade-Off Theory. In addition, because of the relatively low interest expense that can be claimed as tax deduction due to the proportion of taxable income, the after-tax cost of debt takes only a modest amount of tax benefits.

After finding the range of the lowest cost of capital, the calculation of 1% margin of debt level for cost of debt, cost of equity, and cost of capital can be conducted. It is to get a detailed number of the cost of capital that will maximize the firm's value.

o Cost of Equity (1% Margin)

The following table below is the summarized result of cost of equity in 1% with the same method and process as the cost of equity in 10% debt level margin:

Table 5 - OPTIMAL COST OF EQUITY (1%)

Debt Level	Tax (Taxable Income)	Levered Beta	Cost of Equity
20%	4.69%	1.95	16.48%
21%	4.69%	1.97	16.61%
22%	4.69%	2.00	16.73%
23%	4.69%	2.02	16.86%
24%	4.69%	2.05	16.99%
25%	4.69%	2.08	17.13%
26%	4.69%	2.10	17.27%
27%	4.69%	2.13	17.42%
28%	4.69%	2.16	17.56%
29%	4.69%	2.19	17.72%
30%	4.69%	2.22	17.87%

Based on the previous table, as stated before, the risk of borrowing more money is reflected by the increasing of the levered beta. It results in a higher cost of equity since shareholders will demand higher return to compensate for the risk they bear due to the bigger amount of debt.

o Cost of Debt (1% Margin)

Using the same method and steps as the cost of debt within 10% debt level margin, below is the summarized result of cost of debt within 1% margin:

Table 6 - OPTIMAL COST OF CAPITAL (1%)

Debt Level	Pre-tax Cost of Debt	After-tax Cost of Debt	Cost of Equity	Cost of Capital
20%	7.05%	6.72%	16.48%	14.5293%
21%	7.05%	6.72%	16.61%	14.5288%
22%	7.05%	6.72%	16.73%	14.5284%
23%	7.05%	6.72%	16.86%	14.5279%
24%	7.05%	6.72%	16.99%	14.5275%
25%	7.05%	6.72%	17.13%	14.5271%
26%	7.05%	6.72%	17.27%	14.5266%
27%	7.05%	6.72%	17.42%	14.5262%
28%	7.20%	6.86%	17.56%	14.5658%
29%	7.20%	6.86%	17.72%	14.5668%
30%	7.20%	6.86%	17.87%	14.5678%

Based on the table above, it can be seen that the pre-tax cost of debt value is the same from 20% to 27% debt level. It happens because each debt level's interest coverage ratio results in the same rating, AAA, with a default spread of 0.67% (see Table 1). However, starting

from 28%, the pre-tax cost of debt is increased due to the lower number of interest coverage ratio. Meaning, the firm is riskier by being less likely to cover the interest expense of its outstanding debt with their EBIT. Afterwards, the tax advantage effect is taken into account, resulting after-tax cost of debt is lower than the pre-tax cost of debt.

- o Optimal Capital Structure (1% Margin)

After generating cost of debt and cost of equity within 1% debt level margin, the cost of capital can be calculated. The calculation of cost of capital using (10) can be seen in the following table:

Table 7 - OPTIMAL COST OF CAPITAL (1%)

Debt Level	Interest Coverage Ratio	Default Spread	Pre-Tax Cost of Debt	After-Tax Cost of Debt
20%	17.38	0.67%	7.05%	6.72%
21%	16.56	0.67%	7.05%	6.72%
22%	15.80	0.67%	7.05%	6.72%
23%	15.12	0.67%	7.05%	6.72%
24%	14.49	0.67%	7.05%	6.72%
25%	13.91	0.67%	7.05%	6.72%
26%	13.37	0.67%	7.05%	6.72%
27%	12.88	0.67%	7.05%	6.72%
28%	12.16	0.82%	7.20%	6.86%
29%	11.74	0.82%	7.20%	6.86%
30%	11.35	0.82%	7.20%	6.86%

Based on the calculation, the optimal mix of debt and equity for PT Adhi Karya Tbk is 27% of debt and 73% of equity. Considering the 6.72% of after-tax cost of debt and 17.42% of equity within that proportion, using WACC method, the lowest cost of capital that will maximize the value of PT Adhi Karya Tbk is 14.5262%. As the appropriate amount of debt and equity successfully increases a firm's value, it represents the Trade-off Theory. In addition, it supports M&M second theory which states that tax rate can give benefit in issuing debt, making levered firms have more value than unlevered firms.

D. Financing Strategy for PT Adhi Karya Tbk

Based on the calculation before, PT Adhi Karya Tbk's value will be maximized by having 27% debt and 73% equity as its capital structure, resulting in 14.5262% cost of capital. Meanwhile, the proportion of PT Adhi Karya Tbk's current capital structure before receiving the additional equity through PMN and rights issues is 40% of debt and 60% of equity.

However, given the additional equity in total of 3.87 trillion IDR, the proportion of capital structure of PT Adhi Karya Tbk will be 23% of debt and 77% of equity. Meaning, the weight of debt is lower and the weight of equity is higher than the optimal proportion. Since there is a gap between the optimal capital structure and the capital structure that has included the additional equity, financing strategies

have to be stated for PT Adhi Karya Tbk to reach the optimum number.

Table 8 - CAPITAL STRUCTURE AFTER ADDITIONAL EQUITY

Variable	Current Capital Structure	Optimal Capital Structure	The Gap
Weight of Debt	23%	27%	4%
Weight of Equity	77%	73%	-4%
Debt	2,150,390,880,639	2,485,984,789,483	335,593,908,844
Equity	7,056,960,191,520	6,721,366,282,676	(335,593,908,844)
Total Capital	9,207,351,072,159	9,207,351,072,159	

In regards with the table above, the amount of optimal debt is calculated by multiplying the optimal weight of debt (27%) to the total capital after additional equity (9,207,351,072,159 IDR), which results 2,485,984,789,483 IDR. The same goes to the amount of optimal equity, the optimal weight of equity (73%) is multiplied by the total capital after additional equity, resulting in 6,721,366,282,676 IDR.

Based on the table above, it can be concluded that in order for PT Adhi Karya Tbk to reach the optimal capital structure, PT Adhi Karya Tbk has to decrease its additional equity capital for 335,593,908,844 IDR and issue long-term debt for 335,593,908,844 IDR. This will decrease its cost of capital from 14.66% to 14.53% which will maximize the firm's value. For decreasing the additional equity, as the firms want to avoid the dilution effect by keeping the proportion of government shares 51% and public shares 49%, the deduction allocation will be decreasing PMN for 171,152,893,511 IDR and decreasing rights issues for 164,441,015,334 IDR as shown in the following table:

Table 9 - AMOUNT TO DECREASE FOR EQUITY CAPITAL

Ownership	Shares	Amount to Decrease
Government Indonesia	51%	171,152,893,511
Public	49%	164,441,015,334
Total additional equity to decrease		319,884,943,339

IV. DISCUSSION

Patel, Zeckhauser, and Hendricks (1991) mentioned a behavioral perspective using birds and wildebeest as the analogy of managers that have a tendency to follow their peers or industry in financing decisions. As it is done by group, they note that as a safety number. For instance, even if the debt turns out to be excessive, a management who chooses to take on a considerable amount of debt only because other companies in the sector have done so is unlikely to be fired [5]. However, in this case, PT Adhi

Karya Tbk will receive the additional amount of equity capital that will make the firm deviate from the industry average, not align. As according to Damodaran (2015) the industry average of capital structure is too strong to be ignored [6], the optimal capital structure of PT Adhi Karya Tbk needs to be conducted to assure that the action of additional equity is appropriate. After conducting the analysis, it turns out that the additional equity will shift PT Adhi Karya Tbk to be near its optimal capital structure. The current capital structure of PT Adhi Karya Tbk given the additional equity will be 23% of debt and 77% of equity, while the optimal capital structure based on the analysis above is 27% of debt and 73% of equity. In other words, the optimal capital structure for PT Adhi Karya Tbk is not within the range of industry average, which consists of debt 57% and equity 43%. Therefore, it is proper for PT Adhi Karya Tbk to deviate from the industry average since it is not at the optimal level for the firm.

As mentioned before, PT Adhi Karya Tbk has both taxable and non-taxable earnings from its business lines due to the implementation of final and non-final tax based on the laws of tax income in Indonesia. Nonetheless, PT Adhi Karya Tbk's taxable earning is only 24.71% compared to the non-taxable earning which is 75.29%. Based on article 27 paragraph (2) PP 45/2019 law [13], the interest expense should be allocated based on the proportion of taxable and non-taxable earnings. Meaning, the tax benefit that can be gained from issuing the debt will not be that high since the interest expense that is tax-deductible is only 24.71% from the total interest expense. In regards to the analysis before, it is aligned to PT Adhi Karya Tbk's optimal capital structure at 23% debt level, which is quite low since the benefit from debt is not that high. Moreover, the result of cost of capital calculation in the range of 0% to 30% of debt level is also very close (see Table 3) which indicates that having almost no debt is giving the firm the lowest cost of capital due to the lack of tax benefit. The use of debt is not giving a significant impact to the reduction of the firm's cost of capital since the income of construction business is charged to final-tax. It can be seen in the result of the optimal capital structure analysis, even the optimal capital structure suggests the firm to shift to the mix of 27% debt and 73% equity, the cost of capital is only reduced to around 0.1%. Meaning, the shareholders wealth only increases slightly by shifting to the optimal capital structure. It is in accordance with Trade-off Theory, which explains that a firm will only borrow money until the benefit of issuing debt offsets its costs.

V. CONCLUSION

The scope of the research is to calculate the optimal combination of debt and equity as the capital structure for PT Adhi Karya Tbk. This work aims to maximize the value of the firm and to assess the equity financing from the government in the form of PMN and corporate plan

to issue rights, whether it is an appropriate decision for the firm's optimal capital structure considering it deviates from industry average. For the data in this research, the author used secondary data.

PT Adhi Karya Tbk current capital structure's proportion consists of 40% debt and 60% equity. Within this current mix of debt and equity, the cost of capital of PT Adhi Karya Tbk is 14.66%. If the amount of additional equity from PMN and rights issues as much as 3.87 trillion IDR is added, the current capital structure proportion of PT Adhi Karya Tbk will be 23% of debt and 77% of equity. Meanwhile, in order to reach the optimal capital structure, the mix of debt and equity should be 27% and 73% respectively. By doing so, PT Adhi Karya Tbk can lower its cost of capital to 14.53% and maximize the value of the firm. Thus, there is a gap between the current and the optimal capital structure.

In order to achieve the optimal capital structure, the managerial implementations that has to be made are decreasing the amount of equity capital that the firm planned to raise for 335,593,908,844 IDR and acquiring that amount by debt capital instead. As PT Adhi Karya Tbk wants to avoid the dilution effect by keeping the ownership proportion of 51% Indonesia Government and 49% public, the amount of equity capital should be decreased based on that proportion. In other words, in decreasing the equity capital to reach the optimal capital structure, PT Adhi Karya should decrease the amount of PMN they will receive for 171,152,893,511 IDR and rights issues for 164,441,015,334 IDR. Meanwhile, to increase the debt level, PT Adhi Karya Tbk should issue more debt, whether by issuing bonds or bank loans.

By referring to the optimal capital structure analysis above, it is appropriate for PT Adhi Karya Tbk to deviate from the industry average by increasing their equity proportion and decreasing their debt proportion given the current capital structure before the additional equity. Although industry average is often to be considered as a benchmark, PT Adhi Karya Tbk should not see the industry average as its target capital since it does not align with the firm's optimal capital structure. PT Adhi Karya Tbk should do their own assessment of capital structure to assure its optimal level.

For further research, the author suggests to analyze the effect of final-tax income to the optimal capital structure of construction and real estate industry in Indonesia. Because based on the analysis in this paper, the final-tax income term minimizes the tax benefit that the PT Adhi Karya Tbk able to gain as it is charged directly to the revenue that the firm gets. As a result, the cost of capital is not decreased in a significant way for a lower debt ratio. Therefore, it has to be analyzed whether the optimal capital structure is relevant in this industry.

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Paper 36

What factors are affecting ethical finance in Investment during the COVID-19 pandemic in Indonesia?

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Abstract—Since March 2020, the world has been officially facing the COVID-19 Pandemic. This pandemic has heavily affected the world economy drastically since it affected people's mobilization and interest of the people to invest their money. Which resulted in declining stocks and value of the company, because of the increased unexpected factor that increased risk for companies

Index Terms—COVID-19, Ethical Finance, Indonesia, PESTEL, and SWOT

I. INTRODUCTION

A. Hows the COVID-19 pandemic has changed the world

Coronaviruses are a family of viruses that can cause infections varying from the common cold to more serious illnesses such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The coronavirus (COVID-19) outbreak is a novel strain that has never been seen before in humans [1]. This disease is easily spread by air-bone due to droplets and has affected the global economy drastically [2]. Millions of people around the globe have been affected by the Global COVID-19 disease outbreak, which has spread at an astounding level. [3]. Furthermore, the restrictive policies intended to stop the transmission of the virus, such as travel bans, quarantines, lockdowns, transport limits, social isolation, and the closure of public gatherings and public spaces, harmed economic development and social health in other ways. [4]

COVID-19's unexpected economic decline is not only damaging, but it also has consequences because it triggered demand and supply fluctuations in nearly any human activity. On the supply side, the outbreaks caused supply shortages by reducing labor productivity and supply. Mobility constraints, social distancing, and market failures all threatened the flow of goods and services. Travel bans, mortality rates, and unemployment decreased firms' investments and domestic consumption, and deteriorated economic prospects reduced firms' investments and household consumption [3]. Since the pandemic has affected global economy supply and demand, it is not only a medical issue, but also a socio-economic concern that is constraining the global sustainable development goals [5].

The effect on the international stock exchange was the most obvious result of the COVID-19 crisis on the stock market. As shown by S&P Dow Jones Indices, global financial markets lost \$6 trillion in six days between February 23 and February 28. The S&P 500 index declined by 28% (from 3,373 to 2,409), the FTSE 250 stock dropped by 41.3 percent (from 21,866 to 12,830), and the Nikkei sank by 29% between February 20 and March 19 (from 23,479 to 16,552). Citigroup's stock price dropped by 49 percent (from US\$78.22 to US\$39.64), JP Morgan Chase's share price dropped by 38 percent (from US\$137.49 to US\$85.30), and Barclays' share price declined by 52 percent (from 181.32 to 86.45) over the same timeframe [2].

B. Ethical Finance

Integrating investment decisions with environmental and societal considerations is what ethical investing implies. It refers to the prudent use of financial capital in order to optimize financial gains while simultaneously enhancing social and environmental values. In the last few years, the ethical behavior of financial institutions has come into heightened scrutiny [6].

II. METHODOLOGY

A. SWOT

SWOT analysis is a commonly utilized tool for analyzing internal and external situations in order to develop a precise approach and support for a decision-making process [7]. According to Zavadskas, Turskis, and Tamosaitiene (2011) SWOT is a situational appraisal technique used by strategic planners of a project or business enterprise to determine current position and select the best options for the potential course [8].

1. Strength

One of the strengths that Ethical Finance has is maintaining a reputable image to the society and clients. With a great reputation and image, a brand or company builds, it is able to obtain a great corporate image. It is also able to minimize the chance of decreased financial risks since it is basically done ethically based on the culture.

2. Weakness

It needs a lot of research to be done to be able to align the strategy and interest of the investors and clients of

the company. Not every company has the same goal and the same company culture as the investor has. Hence, an investment that is done by applying ethical finance has changed to give a lower optimal number rather than basic investment since there was not any obstacle in creating a strategy to be able to match cultural goals that need to be obtained

3. Opportunities

Many people understand that building the image of a brand is important. Therefore, there is still potential for growth in the future.

4. Threat

Measurement of ethical is very subjective.

B. PESTEL

1. Political

For politicians and economists, ethics is a big rule; once all people practice ethics, they will be able to understand how people use ethics in their everyday lives, making it possible for them to develop existing policies and create new ethical business policies [9]. Level of corruption in Indonesia is quite high. Taxation in Indonesia itself is very tight and strict. However, Indonesia itself is a country where the government is very open to investment, therefore, in term of law, it is not very strict

2. Economic

Indonesia experience resection during the pandemic. IHSG is decreasing quite dramatically during the period

3. Social

Demographic and skill level of the population of Indonesia is dominated by productive ages (18-65 years old). The class gap between them is quite big.

4. Technology

AI and machine learning is quite developed currently in Indonesia. Many applications to open stocks are able to be reached in Indonesia.

5. Environmental

Climate change and direct impact to the natural environment is overlooked. However, it is handled by the government by AMDAL.

6. Legal

Investment in Indonesia is very supported by the government. Investors are very welcome to invest in Indonesia and will be made easy and be helped during the implementation.

III. CONCLUSION

An ethical finance is recommended to be applied in Indonesia, but on during the pandemic. During the pandemic many people are decreasing their investment since there are many more factors that are unexpected and need to be calculated.

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Paper 37

Impact of Mutual Funds Online Platform in Increasing the interest in Investment from generation Z's in Indonesia

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Abstract - Digital solutions and technologies have a lot of potential to bring solutions towards business services [36]. In the financial sector, Investment is an important component in the growth of the economy, especially in developing countries like Indonesia. Because it is a volatile component of GDP That brings direct contribution to economic activity. One of the forms of investment is Mutual Fund that is relatively safer and mostly used by youths in Indonesia. Current capital market is dominated by Generation Z and Millennials that reached a number of Single Investor Identification until 3.58 Million (KSEI, 2021). Because the number of investors from Gen Z is still relatively modest, this research aimed to study the impact of online mutual fund platforms in increasing the interest of Generation Z in investment. With a quantitative method using a survey to 215 Generation Z mutual funds online platform users in Indonesia, the result showed that the impact of it to its behavioral intentions toward the interest of investment is positively correlated. Also, factors generating that facts are performance expectancy, effort expectancy, facilitating condition and habit which are components of UTAUT 2 theory by Venkatesh, 2000.

I. INTRODUCTION

Today, we're facing industry 4.0 aiming for 5.0 in the future and digitalization are normalized. Digital solutions and new technology have a lot of potential for overcoming major development hurdles and can help us get closer to our objective of general access to all types of business services [11]. ICT can improve the quality of the population's socioeconomic life by facilitating digital distribution channels and improving the reach and provision of necessary financial and non-financial services [12]. In recent years, Indonesia has seen a considerable expansion in the use of information technology and innovation in the financial services sector [18]. The adoption of innovation and the embrace of digital changes to improve the efficiency and performance of financial institutions is linked to their existence [9].

Investment plays a very important role in the growth of the economy, especially in developing countries like Indonesia. Based on Najid (2012) Because investment is the most volatile component of GDP, it makes a direct contribution to economic activity. Long-term and short-term growth are both dependent on investment. Especially in developing countries, development of the economy

has gone through the capital market, which is defined as activity relating to public offerings and securities trading, public companies associated with securities issued, and securities-related organizations and professions. One form of investment is "Mutual Funds". Quoted from Setiawan, 2016 this type of investment is very common and relatively more safe among students. The emergence of online mutual funds, which have begun to spread widely in Indonesia, is one of the true kinds of innovation. Starting in 2016, PT Manulife Asset Management Indonesia (MAMI) launched K2likMAMI, Indonesia's first online mutual fund service, which prompted other FinTechs to follow suit and offer online mutual fund services with a variety of different features.

Even though since the introduction of online mutual fund investing platforms, the number of mutual fund investors has increased, It is difficult to convert traditional mutual funds to an online platform since few online mutual funds have been successfully adopted by Indonesian investors [18]. In the current situation, Indonesia has the fourth largest population in the world. Based on Indonesia's Central Bureau of Statistics in December 2021, the population of Indonesia has reached the number of 286 Millions. From that big number, generation Z itself has taken 27.4% which is 74.8 million of people. The number of young investors in Indonesia continues to rise year after year, indicating that the industrious young generation now has the upper hand [13]. According to the Central Statistics Agency's census data, Indonesia's population currently stands at 270.20 million people, with the millennial generation accounting for 25.87 percent and Gen Z accounting for 27.94 percent. The capital market is currently dominated by Millennials and Generation Z, according to data from the Indonesian Central Securities Depository (KSEI) which shows that the total Single Investor Identification (SID) reached 3.58 million by the end of November 2020. Despite a decrease in net asset value and subscription and redemption transactions, the Mutual Fund saw a 13 percent growth in investors, bringing the total to 7.7 million. With 97% of total asset ownership, local investors lead the Mutual Fund sector. Around 80% of Mutual Fund investors choose to become clients of fintech-based Mutual Fund Selling Agents who control digital infrastructure that allows transactions.

However, as compared to the number of Generation Z in Indonesia, the number of mutual fund investors is still relatively modest. Meanwhile, the government considers

that increasing investor numbers can be one of the macroeconomic growth supporting aspects. There are currently just a few studies in Indonesia that explore aspects impacting technology adoption toward online mutual funds, with Generation Z as the study's focus. Also, to see the correlation on what motivates the Generation Z and millennials in investing. Therefore this research will add up information on validation on if the digitization in financial services industry which is also known as fintech, especially in mutual funds has brought significant impact in increasing the investment interest from Generation Z.

II. LITERATURE REVIEW

A. Generation Z

Generation Z refers to people born between the mid-1990s and the early 2000s, during the decade after the broad adoption of the World Wide Web. The offspring of Generation X make up the majority of Generation Z, while some may be descendants of later Baby Boomers.

They are tech savvy and have showed the ability to look at a situation, put it in context, analyze it, and make a choice, but they lack problem-solving abilities and have not demonstrated the capacity to look at a situation, put it in context, analyze it, and make a decision [8].

Generation Z is the most ethnically diverse and technologically advanced generation, according to the Institute for Emerging Issues (2012). Generation Z can function in both the real and virtual worlds, according to experts. Because they see these two worlds as compatible, they may readily move between them [24]. As a result of this condition, Generation Z representatives can simply obtain and verify the information they require. They also communicate with people fast. Because they use a range of communication devices and social media, they are constantly digesting information. "Active social media users have a large number of contacts, and they mostly conduct their daily interactions through these channels "real encounters are also important to them, but maintaining online contacts is as vital" [19]. Generation Z in Indonesia is one of the generations with the top contribution to the Indonesian investment sector. Millennial and Generation Z local investors account for 80% of all investors in the Indonesian Capital Market.

B. Mutual Funds Online Platform

Mutual funds are a collection of money saved by a group of investors with a common financial purpose [19]. Mutual funds are thought to be the finest way to accept small investor funds while also contributing significantly to the capital market [41]. Mutual funds (mutual funds) are institutions that gather money from investors and invest

it in securities such as stocks, bonds, and other money market instruments, according to Reilly and Brown (2000:1207). Meanwhile, based on Gumanti (2011), Mutual funds are investment businesses that take funds from the public and manage them by investing in a variety of securities.

The Capital Market Act No. 8 of Indonesia was the first to introduce mutual funds to the country (1995). Following the establishment of the first mutual fund, BDNI Reksadana, in 1996, a total of 25 mutual funds with a total managed value of Rp2.78 trillion were founded in the same year. The number of mutual funds expanded by 208 percent from 1996 to 77 in 1997, with Rp4.91 trillion in total funds managed. Macroeconomic factors have had a significant impact on the development of the mutual fund business in Indonesia. When the country was rocked by financial upheaval in 1997, mutual fund development stalled. The number of issuers increased by just 5.19 percent in 1998, while the value of issuers fell by 39.22 percent from 1997. The bond market was in much worse shape during this time, with virtually no new issuance (BAPEPAM Master Plan 2005-2009).

Mutual funds in Indonesia are generally classified into five categories: equities, fixed-income, money market, balanced-mixed, and protected funds. Fixed income, which accounted for 47.3 percent of total net asset value in 2005, was followed by balance funds, which accounted for 18.5 percent, and money market funds, which accounted for only 0.7 percent. The majority of fixed income was invested in government debt/securities (2.4 percent of total) and corporate debt (45.1 percent of total). The bond price has been negatively impacted by the Bank of Indonesia's decision to raise interest rates to roughly 12% in order to sustain currency and inflation rates.

C. Framework Development

Given that online mutual funds have only been available in Indonesia since 2016, and that the number of users is increasing year by year, it is critical to employ a study model for technology implementation based on a number of past studies. A variety of analytical mechanisms have been developed to investigate the implementation intentions of related information technology and information systems (IT / IS) such as the technology acceptance model (TAM) [15], the technology-organization-and-environment (TOE) framework [21], the theory of planned behavior (TPB) [1], and the extension of the unified theory of acceptance and use of technology.

This framework built on eight previous versions and introduced four primary elements to study and forecast workplace technology adoption in a business context [5]. The theory of reasoned action, TAM, motivational model,

theory of planned behavior (TPB) combination of TAM and TPB, model of PC utilization, innovation diffusion theory, and social cognitive theory were all evaluated to come up with the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT [22] was transformed into UTAUT2 (2012) [23] by adding more variables than the original UTAUT. Hedonic Motivation (HM), Price Value (PV), and Habit are the variables (H). Despite the fact that the previous model has already.

D. Social Influence

The degree to which a person's family, relatives, or associates respected their views on specific technologies is referred to as social influence. This person purchases such investments through an online mutual fund platform with the help of their friends and family. This is also an important factor to consider because it is a direct sign of behavioral purpose.

E. User Interface

Customer impressions of the website's e-commerce interface quality are referred to as user interface [5]. The quality of the user interface has been shown to have a significant impact on the performance of online retail, and the value of customer interface design on consumer behaviors has been thoroughly examined [2]. Hasan & Ahmed in 2007, discovered that the user interface has an indirect effect on behavioral intention due to its direct effects on perceptions of ease of use and utility. Because there is still a paucity of evidence on the relationship between user interfaces and behavioral intention in the setting of online mutual funds, researchers proposed.

F. Content Design Quality

The quality of content design includes device design, a simple interface, effective operation, and up-to-date features that will influence users' first impressions of applications. In addition, superb screen layout and architecture, simple visuals, and vibrant color arrangement are all basic requirements for effective online design [17]. The current study focuses on Aladwani and Palvia's (2002) definition of web design quality as a user's judgment of the functionality of a website that meets their expectations and represents the website's overall excellence.

G. Perceived Trust

The degree of reciprocal trust that exists between the consumer and the marketer determines the success of the complicated relationship between them. According to online behavior analysis, including a confidence factor to acceptance models is beneficial since it allows for the interpretation of consumer activities while adopting and using electronic resources (Carter & Weerakkody, 2008)

Chong et al, have found that trust is a key component in determining adoption intentions for similar technologies.

H. Hedonic Motivation

When a person uses technology, it is described as a sensation of anticipation, pleasure, or delight [54]. The findings of Brown and Venkatesh indicate that customers who use technology for their own benefit are more likely to interact with the nature of pleasure and delight. This person frequently pays more attention to technological advancement, which in turn leads to the influence of hedonic drive. This component has been proved to be important in the measuring of technology acceptance and practical use in the sphere of market use. Age, gender, and experience are three moderating characteristics that are frequently associated with hedonic motivation.

I. Performance Expectancy

The degree to which a person believes that the use of technology will assist persons in doing specific behaviors was defined as expectancy [24]. Consumers feel that using technology to buy any investment will boost their efficiency in the establishment of investment transactions in the case of online mutual funds. PE is equal to six constructions from previous versions, including perceived usefulness in TAM/TAM2 and TPB, extrinsic motivation in MM, job-fit in MPCU, relative advantage in DOI, and result expectations in SCT.F.

J. Effort Expectancy

The characteristic of ease associated with the application of technology or the method was recognized as effort expectations. This variable, in the instance of online mutual funds, shows how simple the system is to use and how easy it is to grasp the operation of online mutual funds. The apparent ease of use taken by TAM / TAM2, the complexity adopted by MPCU, and the ease of use used by IDT are all examples of this concept. This element was taught to be viewed as a fundamental factor in the original UTAUT model, as it frequently impacts behavioral intent [24].

K. Facilitating Condition

The degree to which a person assumes that the successful deployment of innovations enabled by suffocated resources or access to and support of the ecosystem is decided by facilitating conditions. The definition is built from three unique constructions: TPBI, DTPB, and C-TAM-TPB, as well as MPCU's enabling conditions and IT's compatibility. Supporting each user in terms of UTAUT2 device use is dependent on demand, and each user may have a different level of connectedness to the various technologies available on the market [24].

L. Habit

The term "habit" refers to how a person interacts with technology and how they utilize it on a regular basis. It's also linked to activity, as activity can shape various forms of habit over time, or, to put it another way, experience can symbolize the impacts of habit. If a person wants to do anything in the context of technology and only has a limited amount of time, there may be a single pattern for doing so [24] & [10].

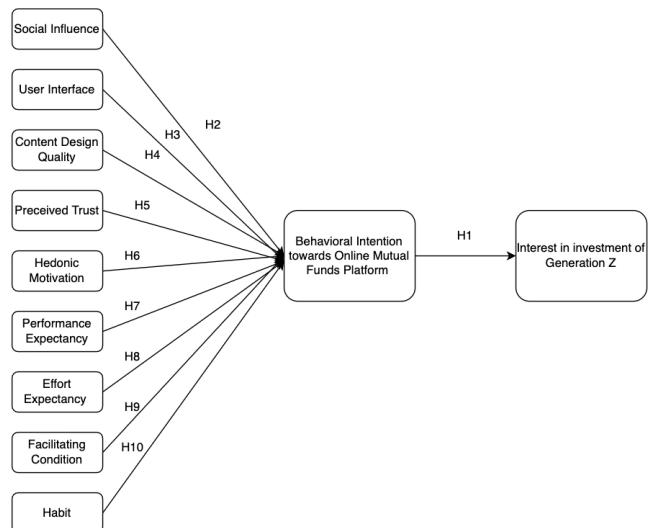
M. Behavioral Intention

Behavioral intention is when a person's activities influence how they utilize their technology in real life [24]. Many of the findings from Venkatesh, indicated that behavioral intent can have a significant impact on how technology is used in the real world. Many prior researches have examined many elements such as PE, EE, PR, SI, price, trust, and the like to determine BIs towards technology adoption. BI is used as a dependent variable in this study.

N. Conceptual Framework

Researchers have identified a number of characteristics or causes that have had a favorable impact on adoption decisions in the context of online mutual funds. Previous studies mentioned that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, and perceived trust will have a positive effect on behavioral intention, using UTAUT2 as the conceptual framework and combining it with a study by [18]. Furthermore, it was discovered that the quality of the content design and the user interface are predictors of performance and effort expectations. Furthermore, due to the limited number of studies conducted in this subject, researchers have discovered that there is insufficient information available on real acceptance or usage rates for Indonesia's online mutual fund.

Researchers took the theory from Venkatesh, 2012 as the based theory of UTAUT 2 and the study from E.K Dewi and R.A Rahadi 2021 as the basis on developing the conceptual framework. Therefore, with some modification based on the correlation between the Generation Z characteristics, researcher eliminate several factors from previous research until it developed this conceptual framework:



Therefore, this research needs to be done because we need to know how impactful an online platform of mutual funds is in increasing the interest of investment in Generation Z which has never been researched before. Also, because Generation Z is in their productive age and the generation that gives much impact in Indonesia investment sector.

III. METHODOLOGY

Following the theory from Basias & Pallais, The research will be conducted using a quantitative approach. This research will include respondents from Generation Z (aged 12-126) who are domicile or came from Indonesia. The specific target population is Gen Z that currently have experience or still using mutual funds. The population of this research is estimated around 1,238,643 based on the data gathered on Generation Z that is investing in the stock market. Approximately 205 people is appropriate for this minimum amount of sample (Maholtra, 2010). This research used probability sampling for its sampling techniques. Every item in the population has an equal chance of being included in the sample under probability sampling [20].

In this study, researchers used the IBM SPSS mac version (statistical program for social sciences) as a platform to synthesize the data. Researcher uses several methods of descriptive statistics, The reliability analysis, validity analysis, Normality testing and the average total score technique method are all descriptive statistics methods

based on Likert-scale statements used by researchers.

Also, the variables details are included below:

UTAUT 2	Operationalization	Measurement	Expected Relationship		determines the success of the complicated relationship between them.		
Social influence	how people influence one's decision	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive	Hedonic Motivation	described as a sensation of anticipation, pleasure, or delight that drives their decision making process in using online mutual funds platform	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive
User Interface	The look of the app influencing the decision making in choosing online mutual funds platform	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive	Performance Expectancy	The degree to which a person believes that the use of technology will assist persons in doing specific behaviors was defined as expectancy.	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive
Content Design Quality	The quality of content design includes device design, a simple interface, effective operation, and up-to-date features that will influence users' first impressions of application that helps the decision making process in choosing an online mutual funds platform	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive	Effort Expectancy	The characteristic of ease associated with the application of technology or the method was recognized as effort expectations	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive
Perceived Trust	The degree of reciprocal trust that exists between the consumer and the marketer	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive	Facilitating Condition	The degree to which a person assumes that the successful deployment of innovations enabled by suffocated resources or access to and support of the ecosystem is	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive

	decided by facilitating conditions.		
Habit	The term "habit" refers to how a person interacts with technology and how they utilize it on a regular basis	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive
Behavioral Intention	Behavioral intention is when a person's activities influence how they utilize their technology in real life	Likert scale 1-5 (1 for "strongly disagree" and 5 for "strongly agree")	positive

IV. RESULTS

Validity & Reliability Testing

Before doing the research the researcher did several testing to make sure that this research is valid to proceed. the process has gone through normality testing, linearity testing, absence of multicollinearity testing and homoscedasticity testing. for the normality testing, the z value gives the p value Of $0.2 > = 0.05$ which means that the hypothesis is accepted and the data is normally distributed. For the linearity testing, this research is using the method of Durbin-watson and the Durbin-Watson score is also nearer to 2, therefore this data is assumed to be linear. in the absence of multicollinearity testing, we can see that all of all variables are tested moderate. last but not least, the homoscedasticity testing also shown that the data doesn't have any specific structure.

Multiple Linear Regression

Multiple Regression Analysis is a collection of approaches for investigating the straight-line associations between two or more variables. The's in the equation are estimated using multiple regression.. Least squares is the most used strategy. The b's are chosen in least squares regression analysis to minimize the sum of the squared residuals. In order to develop a multiple regression, firstly researcher tried to understand the The fundamental regression model is as follows:

$$i = 0 + 1 + 2 + 3+...+n +$$

The regression coefficients ('s) are the weights in this expression, which depicts the relationship between the dependent variable (DV) and the independent variables (IV's)as a weighted average. In contrast to the conventional weights in a weighted average, regression coefficients can be negative. For this research, researchers use this method to do a coefficient estimation to confirm a theoretical relationship made by the researcher. With the previous statement, researcher tried to make two model for different hypothesis as shown below:

Hypothesis 1:

$$II = + BI + \epsilon$$

II : Interest in investment

α : Constant

β : Coefficient Regression

BI : Behavioral Intention

ϵ : Residual Value

Hypothesis 2-10:

$$BI = + SI + UI + CD + PT + HM + PE + EE + FC + H + \epsilon$$

BI : Behavioral Intention

α : Constant

β : Coefficient Regression

The rest stand for: Social Influence, User Interface, Content Design Quality, Perceived Trust, Hedonic Motivation, Performance Expectancy, Effort Expectancy, Facilitating Condition and Habit

ϵ : Residual Value

C. Hypothesis Testing

The t-statistic and P-value are used to determine the status of a hypothesis. If the T-statistic value of a hypothesis is more than 1.96, it is accepted; otherwise, it is rejected based on the theory of [6]. From table 5 we can examine that the T-value from social influence, content design, perceived trust, and hedonic motivation are rejected. Therefore, needed a further examination through the significance, If the P-Values are less than 5%, [6]. From here we can also see that social influence, content design, perceived trust, and hedonic motivation are rejected because the significance are above 5%.

Model	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1	(Constant) 1.231	.910		1.353	.178
	Behavior Intention .739	.077	.561	9.617	<.001

a. Dependent Variable: Interest Investment

Fig. 1. Magnetization as a function of applied field.

Note how the caption is centered in the column.

This coefficient correlation corresponds to hypothesis 1 which indicates that there is a correlation between the behavioral intention towards the interest of investment of generation Z. The final equation for this model is:

$$II = 1.231 + 0.561 + \varepsilon$$

It shows from the data that the significance of the item is below 0.05 and the T value is way above 1.96.

Model	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	-1.122	.677	-1.657	.099
	Social Influence	.012	.052	.011	.238 .812
	User Interface	.052	.063	.033	.832 .407
	Content Design	.060	.051	.047	1.171 .243
	Perceived Trust	.049	.039	.063	1.257 .210
	Hedonic Motivation	-.035	.045	-.042	-.759 .449
	Performance Expectancy	.141	.049	.167	2.898 .004
	Effort Expectancy	.131	.046	.134	2.864 .005
	Facilitating Condition	.201	.044	.258	4.589 <.001
	Habit	.408	.059	.395	6.906 <.001

a. Dependent Variable: Behavior Intention

Meanwhile in this coefficient correlation corresponds to hypothesis 2-10. The final equation for this model is

$$BI = -1.122 + 0.11 + 0.33 + 0.47 + 0.63 - 0.42 + \\ 0.167 + 0.134 + 0.258 + 0.395 + \varepsilon$$

For Social Influence, User Interface, Content Design, Perceived Trust and Hedonic Motivation it showed that the value of significance is above 0.05 and below 1.96, that means those factors don't correlate with the behavioral intention towards online mutual fund platform towards generation Z. and for the res, which are Performance Expectancy, Effort Expectancy, Facilitating Condition and Habit have a correlation with behavioral intention, because they have the significance above 0.05 and the T value below 1.96.

B. Research Findings

Researchers identified variables or drivers that have had a favorable impact on the interest in investment from Generation Z after studying diverse literatures. Using the concept

Hypothesis	Description	Status
H1	There is an impact of mutual funds online platforms in Indonesia in increasing the number of investors from Generation Z in Indonesia	Accepted
H2	Social influence affect behavioral intention of generation z towards their interest in investment	Rejected
H3	User Interface affect behavioral intention of generation z towards their interest in investment	Rejected
H4	Content Design affect behavioral intention of generation z towards their interest in investment	Rejected
H5	Perceived trust affect behavioral intention of generation z towards their interest in investment	Rejected
H6	Hedonic Motivation affect behavioral intention of generation z towards their interest in investment	Rejected
H7	Performance Expectancy affect behavioral intention of generation z towards their interest in investment	Accepted
H8	Effort Expectancy affect behavioral intention of generation z towards their interest in investment	Accepted
H9	Facilitating Condition affect behavioral intention of generation z towards their interest in investment	Accepted
H10	Habit affect behavioral intention of generation z towards their interest in investment	Accepted

IV. DISCUSSION

A. Comparisons of Results to Previous Studies

Compared to the previous study from Dewi & Rahadi (2020) it mentioned that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, have positive impact towards behavioral intention. But this study found that social influence and facilitating conditions don't have any correlation with behavioral intention. After reviewing a number of studies, from Shulhan (2019), Chiu & Yang (2016) and Hasan & Ahmed (2007) it was discovered that perceived trust, content design quality, and user interface are all drivers of behavioral intention. But through this research, researchers found a different result that the three factors don't have any correlation with behavioral intention.

B. Further Analysis and Evaluation

The gap that we had from the result of the data between our data and the previous research is possibly due to the gap of generations. Previous studies, done their research with millennials and this study conducted the research with Generation Z. Therefore, we can also conclude that the generation gap also impacted the issue.

V. CONCLUSION.

A. Summary of Paper

To conclude the result of this research, this summary will explain:

RQ. 1 : How is the impact of Online Mutual Funds Platform in increasing the interest of investment of Generation Z in Indonesia?

For this research questions, researcher can conclude that there's an impact of online mutual funds platform in increasing the interest of investment of Generation Z towards the behavioral intention in using the platform with the basic theory of UTAUT 2.

RQ. 2 : What factors are influencing the Generation Zs intention to invest in online mutual funds platforms in Indonesia?

For this research questions, researcher can conclude that factors that influencing the behavioral intention of using online mutual funds platform are performance expectancy, effort expectancy, facilitating condition and habit.

B. Recommendations

From this research, researchers can give a recommendation to all online mutual fund platforms to understand generation behavior in improving the products or services in order to gain more users. Also, researchers recommend Generation Z to invest more during this productive age and also to help increase the number of financial literacy in Indonesia through investment.

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Paper 38

The Effect of Financial Literacy on Financial Behavior of Millennials in Jakarta

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ICMEM

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Abstract - The purpose of this study is to determine the level of financial literacy of millennials in Jakarta and to determine the effect of financial literacy, income, and age on financial behavior of millennials in Jakarta. The research also aims to give recommendations to improve Jakarta millennials' financial behavior. The data is collected from 400 respondents. The research found that the financial literacy index of millennials in Jakarta is 80.01% which is categorized as high financial literacy. By using multiple linear regression, this research found that financial literacy, age, and income simultaneously affect financial behavior of millennials in Jakarta. Partially, financial literacy and income positively affect financial behavior of millennials in Jakarta while age negatively affect financial behavior of millennials in Jakarta.

Keywords – Financial Literacy, Demographic Factors, Financial Behavior, Millennials

I. INTRODUCTION

In this era of digitalization, financial literacy should be seen as a fundamental right and universal need as without financial literacy, individuals and societies cannot reach their full potential [1]. Financial literacy has become the focus of government, organizations, businesses, and lawmakers [2]. The growing number of accesses to financial instruments, the changing economic landscape, and the increasing number of financial decisions that individuals have to make throughout their lives suggest that improving financial literacy should be a priority for policy makers [1].

The population's level of financial literacy can be represented through its country's financial literacy index. According to the 2019 National Financial Literacy and Inclusion Survey (SNLIK) by OJK, Indonesia scored 38.03% on the financial literacy index. The current financial literacy index shows an improvement over the findings of the 2016 survey, which had a financial literacy index of 29.7%. This implies that there is an enhancement in community knowledge regarding financial services. However, despite the fact that the index has been rising over time, the number indicates that Indonesia's financial literacy level is still low, with six out of ten people in the country being financially illiterate.

Among the 34 provinces in Indonesia, the highest financial literacy index is still occupied by DKI Jakarta with a

financial literacy index of 59.16% [3]. DKI Jakarta has a high population growth rate and a high flow of human mobility, both from the people of DKI Jakarta itself, and from people outside the surrounding areas who depend on the city for their livelihood. The status of DKI Jakarta which is the center of government as well as the center of economic activity also adds to the impact on the development or movement of the wheels of economic, social and cultural life of society in general. With this condition, Jakarta is expected to be a reflection of financial literacy in Indonesia and other big cities. Hence, Jakarta is selected as the object of the research that will be carried out.

The younger generations, notably Generation Z and Millennials, make up the majority of the population in Indonesia, accounting for 27.94% and 25.87% of the total [4]. This condition makes the younger generation play the role of critical economic actors. However, the financial literacy index of some of these groups, especially those aged 15-17, is only 16% which is even lower than the national financial literacy index. The age group of 18-25 years has a literacy index of 32.1%, while the age group of 25-35 years has a literacy index of 33.5% [3]. In addition to dealing with the more complicated financial products, services, and markets, millennials are also more likely to have to take on bigger financial risks in the future.

Financial literacy affects everything from basic financial decisions to financial decisions that have a long-term impact [1]. UOB Indonesia Economics and Market Research points out that millennials in Indonesia spend up to 50% of their income on a '4S lifestyle' consists of Sugar (food and beverages), Skin (beauty and personal care), Sun (travel), and Screen (digital screen consumption). Another data from Organization for Economic Co-operation and Development (OECD) states that only approximately 10.7 percent of millennials' income is set aside for savings, with 51.1 percent going toward monthly expenses and lifestyle. In addition, only around 35.1 percent of millennials own their own home.

Besides Financial literacy, other factors can be seen from the income of the individual. Because each individual is different in utilizing his income. There is a high possibility that individuals with adequate income will show financial management behavior that is more responsible [5].

An individual's way of managing their finances is often associated with financial behavior. Budgeting, determining the necessity of a purchase, prioritizing needs, and other activities are all part of the process of managing finance [6]. Financial behavior is defined as an individual's behavior related to finance that can affect the well-being of the individual [7]. The ability to manage one's money well is a basic human need.

Previous research has looked at how financial literacy affects financial behavior. There is evidence from several studies that financial behavior and financial literacy are positively correlated [6] [8] [9] [10]. Greater financial behavior in later life is strongly correlated with higher levels of financial literacy [11]. The research's findings on how financial literacy affects financial behavior, however, seem contradictory. According to another study, financial literacy has no impact on financial behavior [12] [13]. This study intends to reexamine the impact of financial literacy, as well as demographic factors of age and income on financial behavior in order to fill the research gap.

A. Financial Literacy

Financial literacy is defined as a process of understanding financial knowledge, financial awareness and financial experience to be used in financial decision making through improving positive financial management skills and abilities so as to have positive financial behavior to achieve financial goals and freedom [7]. Financially literate individuals will have positive impacts not only in daily life but such things as participating in the capital market [14], therefore, it is important to teach financial literacy from an early age.

Financial literacy is divided into two categories, basic financial literacy and advanced financial literacy [15]. The questions were developed based on three economic principles, functioning of interest, compound interest, understanding of inflation, and the fundamentals of risk diversification, that people should have some grasp of to use in making financial decisions. Meanwhile, advanced financial literacy is assessed through questions regarding risk and return, difference between bonds and stocks, the working of bonds stocks and mutual funds, and basic asset pricing.

B. Financial Behavior

Financial behavior can be defined as any human behavior that is related to money management [16]. In line with the other definitions, financial behavior is also defined as something relevant to how an individual handles, controls, and operates their personal financial resources [17].

Financial behavior is measured through questions related to personal finance management (such as how often they check the balance in their savings account and keep track of their household's income and expenses), money management, financial planning (including setting aside money for pension funds), choosing which insurances to buy, and the sources of information they use to stay informed [18].

Reference [19] classified the dimensions of financial behavior as consumption, cash flow management, and savings and investment.

C. Demographic Factors

Demographic factors are essential for the researcher to know the characteristics of the respondents. Age, gender, the number of children, education, income, and marital status are all demographic variables that affect a person's ability to make financial decisions [20]. In this study, 2 demographic factors, namely age and income are used.

D. Millennials

Millennials, also known as Generation Y, were born between 1980 and 2000 [21]. Reference [22] define the term millennials to be applied to the generation between 1982 and 2000. Millennials in this study are the generation born between 1980 and 2000. Because millennials grew up with computers and the internet, and are thought to have inherent talent and a high degree of ability when using new technologies, they are considered the most technology-oriented of all other generations (i.e., baby boomers, generation X) [23].

According to reference [24], millennials have the characteristics of wanting to always follow trends and love themselves because they grew up with the rapidly developing technology and internet conditions, coupled with increasingly varied television shows. In addition, each generation has a different lifestyle. This generation is used to the kind of lifestyle with goods that are always up to date, places more importance on vacations to fulfill the desire for selfies in beautiful places rather than fulfilling their main life needs, and often spends time in expensive cafes or even buying designer clothes [25].

F. Conceptual Framework

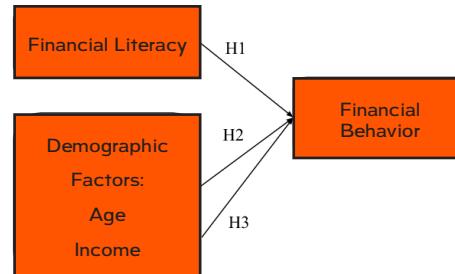


Fig. 1. Conceptual Framework.

The researcher's aim in this study is to analyze the effect of financial literacy and demographic factors on financial behavior of millennials in Jakarta. The independent variable (X) is financial literacy and demographic factors which are represented by age, gender, education, and income, while the dependent variable (Y) is financial behavior. The conceptual framework of this research is presented in Figure 1.

F. Research Hypothesis

The hypothesis for this study will be stated as follows:

- H1 : Financial literacy level has a positive significant effect on financial behavior of millennials in Jakarta
- H2 : Age has a positive significant effect on financial behavior of millennials in Jakarta
- H3 : Income has a positive significant effect on financial behavior of millennials in Jakarta

II. METHODOLOGY

A. Data Collection Method

Primary data is obtained from questionnaires that are distributed online. The respondents are millennials who were born between 1980 to 2000 who live in Jakarta. The questionnaire is divided into two components; financial literacy and financial behavior. The contents of the questionnaire that are asked to respondents are questions to measure their level of financial literacy and financial behavior tendencies.

B. Data Analysis Method

A total of 400 respondents were collected through questionnaire. The data collected were analyzed mostly using SPSS. The validity and reliability of the questionnaire were tested using SPSS. After the questionnaire is proven valid & reliable, classical assumption test are conducted. Afterwards, the multiple linear regression analysis is conducted to test the hypothesis.

III. RESULTS

A. Respondent Demographics

The demographic profile of the respondents will be explained in this section according to the age, gender, education, and income of the respondents.

The distribution of respondents for each age is random but each age has at the minimum of 3 representatives. The questionnaire was distributed online so it is more

accessible for the younger ages as the younger generation are more engaged in social media. The majority of the respondents are 22 years old with the number of 79 which accounted for 19.8% of the total respondents. In addition, the respondents aged 21 are 3.25%, the respondents aged 23 are 14.50%, respondents with the age of 24 are 8.00%, respondents with the age of 25 are 7.50%, respondents with the age of 26 are 7.25%, respondents with the age of 27 are 7.50%, respondents with the age of 28 are 3.00%, respondents with the age of 29 are 3.75%, respondents with the age of 30 are 4.75%, respondents with the age of 31 are 3.00%, respondents with the age of 32 are 2.75%, respondents with the age of 33 are 0.75%, respondents with the age of 34 are 1.25%, respondents with the age of 35 are 1.75%, respondents with the age of 36 are 2.00%, respondents with the age of 37 are 0.95%, respondents with the age of 38 are 1.19%, respondents with the age of 39 are 0.75%, respondents with the age of 40 are 2.75%, respondents with the age of 41 are 1.25%, and respondents with the age of 42 are 1.25%. Respondents aged 33 and 37 years were respondents with the least number of respondents, namely 3 respondents or 0.75% of the total respondents.

The majority of the respondents are female which occupy 53.3% of the total respondents (213 respondents). The number of male respondents is 187 with a percentage of 46.7%.

The percentage of high school graduates are 22.7%, the percentage of diploma graduates are 27.0%, the percentage of S1 graduates are 43.3%, and the percentage of S2 graduates are 7.0%. Most of the respondents are S1 graduates.

Based on the income, respondents with monthly income of more than Rp10,000,000 make up the largest proportion of respondents, accounting for 98 respondents or 24.5 percent of the total respondents. The second highest percentage is the respondents with Rp8,000,000-Rp10,000,000 monthly income which occupies 20.8% of the total respondents followed by Rp2,000,000-Rp4,000,000 with 14.2%, Rp4,000,000-Rp6,000,000 with 13.0%, Rp1,000,000-Rp2,000,000 with 11.0%, below Rp1,000,000 with 8.7%, and Rp6,000,000-Rp8,000,000 with 7.8%.

B. Validity and Reliability Test

By correlating each item to the overall score in SPSS, the validity of the questionnaire is evaluated for this research. The validity is established if the item questionnaire's value exceeds the r value of 400 respondents. The r value for this study is 0.098. Additionally, the reliability of the questionnaire is evaluated using SPSS. If the value of Cronbach's alpha is more than 0.6, the reliability of the questionnaire is accepted [26].

Table 1 - RELIABILITY TEST

Variable	No. of items	Cronbach Alpha	Description
Basic Financial Literacy	11	0.685	Reliable
Advanced Financial Literacy	8	0.713	Reliable
Financial Behavior	8	0.737	Reliable

C. Financial Literacy Index

In calculating the financial literacy index of millennials in Jakarta, the researcher uses a simple weight method to be assigned to each variable by dividing 1 to the number of items in each variable. The weight for Basic Financial Literacy is 0.09 (1/11) and the weight for Advanced Financial Literacy is 0.125 (1/8).

After assigning the simple weight to each variable, the index of basic financial literacy, advanced financial literacy, and overall financial literacy are calculated by multiplying the weight to every correct answer (score of 1 for each correct answer) and then multiplying the result with 100 for interpretation purposes.

Table 2 - FINANCIAL LITERACY INDEX

	Index
Basic Financial Literacy	84.75%
Advanced Financial Literacy	75.28%
Financial Behavior	80.01%

As can be shown in Table II, the Jakarta millennials' index of basic financial literacy is 84.75%, index of advanced financial literacy is 75.28%, and the overall financial literacy index is 80.01%. According to the categorization of financial literacy index by reference [18], both the advanced financial literacy is categorized as moderate financial literacy index ($60 \leq FLI \leq 80$). On the other hand, both the basic financial literacy and overall financial literacy of millennials in Jakarta is categorized as high financial literacy index ($FLI > 80$).

Table 3 - DISTRIBUTION OF FINANCIAL LITERACY LEVEL

Financial Literacy Level	Frequency	Percentage
Low	59	14.75%
Moderate	105	26.25%
High	236	59%

In Table III, it is shown that 14.75% of the respondents or 59 respondents have low financial literacy level, 26.25% of the respondents or 105 respondents have moderate financial literacy level, and 59% of the respondents have high level of financial literacy.

D. Classical Assumption Test

a. Normality Test

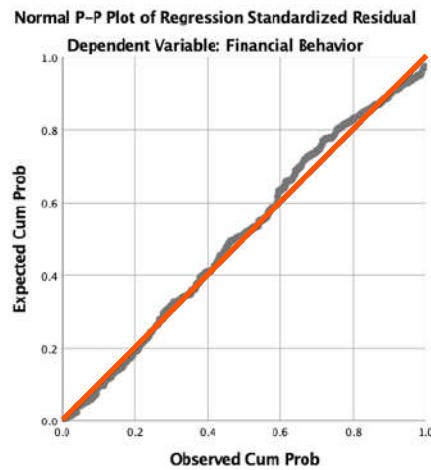


Fig. 2. P-Plot for Normality Test

As can be seen in Figure 2, the residual points spread around the diagonal line. Therefore, it can be concluded that the data are normally distributed.

b. Multicollinearity Test

Based on Table IV, the VIF value obtained for each variable is <10 and the tolerance value is >0.1 , therefore, it can be said that the model does not exhibit multicollinearity.

Table 4 - RESULT OF MULTICOLLINEARITY TEST

Model	Collinearity Statistics	
	Tolerance	VIF
Financial Literacy	0.818	1.222
Age	0.614	1.629
Income	0.526	1.901

c. Heteroscedasticity Test

Based on the results on Table V, it was found that the significant values are 0.441, 0.692, and 0.390 which are greater than 5%, so H_0 has failed to be rejected, which indicates that the model's heteroscedasticity issue is not present.

Table 5 - RESULTS OF HETEROSEDASTICITY TEST

Independent Variables	Sig. (2-tailed)
Financial Literacy	0.441
Age	0.692
Income	0.390

d. Autocorrelation Test

The Durbin-Watson value of this model is 1.943. The upper value (d_U) in the Durbin-Watson table with a sample size of 400 and three independent variables (k) is 1.851, and the value of $4-d_U$ is 2.149. It can be said that there is no autocorrelation because the value of d_W 1.943 is larger than the upper limit (d_U) and less than $4-d_U$ ($1.851 < 1.943 < 2.149$).

E. Multiple Linear Regression

The findings of the analysis of multiple linear regression are displayed in Table VI.

Table 6 - RESULTS OF MULTIPLE LINEAR REGRESSION

Model	Estimate	t	Sig.
(Constant)	29.064	19.955	0.000
Financial Literacy	0.397	5.196	0.000
Age	-0.112	-2.426	0.016
Income	0.269	1.999	0.046

From the regression model obtained, it can be interpreted as follows:

The constant of 29.064 states that if the variables of financial literacy, age, gender, education, and income are considered constant, the value of financial behavior is 28.058.

The regression coefficient X_1 of 0.397 states that each addition of one unit of financial literacy value will increase the value of financial behavior by 0.397 with the assumption that other variables are considered constant.

The regression coefficient X_2 of -0.112 states that for every 1-year increase in a person's age, the value of financial behavior will decrease by 0.112 with the assumption that other variables are considered constant.

The regression coefficient X_3 of 0.269 states that for every 1 category increase in the income, the value of financial behavior will increase by 0.269 with the assumption that other variables are considered constant.

F. Partial Hypothesis Test (T-Test)

The t-test is conducted by looking at the significant value and the t-value. The significant value has to be lower than alpha or 0.05 and the t-value has to be greater than the t-table value for a hypothesis to be accepted. The t-table value in this research is 1.966. The output from partial hypothesis is displayed in Table VII.

Table 7 - RESULTS OF PARTIAL HYPOTHESIS TEST

Hypothesis	Sig.	Result
Financial literacy has a positive and significant effect on financial behavior	0.000	Accepted
Age has a positive and significant effect on financial behavior	0.016	Accepted
Income has a positive and significant effect on financial behavior	0.046	Accepted

G. Simultaneous Hypothesis Test (F-Test)

The F-test is done by looking at the significant value and the t-value. The significant value has to be lower than alpha or 0.05 and the F-value has to be greater than the F-table value for a hypothesis to be accepted. The research's F-table value is 2.627.

Table 8 - F-TEST RESULT

Predictors	Sig.	Result
Financial literacy, age, income	0.000	Accepted

The Sig. value (P-value) in Table VIII is 0.000 which is less than alpha (=5%). The sig. value explains that financial literacy, age, and income simultaneously have a significant effect on financial behavior.

H. R-Square Analysis

Table 9 - R-SQUARE

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.323 ^a	.104	.097	3.96836	1.943

a. Predictors: (Constant), Income, Financial Literacy, Age

b. Dependent Variable: Financial Behavior

Table IX shows that the R-value, which measures the correlation between independent and dependent variables, is 0.323, or 32.3%. The R-square value in this model is 10.4%, which means that the model formed or the existing independent variables can explain 10.4% of the variation of the dependent variable. The adjusted R-square value is 9.7% which indicates that financial literacy and demographic variables have an effect of 9.7% on financial behavior. The remaining 90.3% cannot be explained by the existing independent variables or explained by other variables outside the model.

IV. DISCUSSION

Financial literacy has a significant and positive effect on the financial behavior of millennials in Jakarta. This finding is in line with the findings of previous research from reference [8] which showed that low financial literacy is correlated with poor financial behavior, in this case debt problems. With good financial literacy, people will understand better in managing their finances well, so they can control their desire to buy things that are not too important and save more on expenses or at least determine a budget that suits their income. This finding also supports the previous study by reference [9] where it is stated that financial literacy at a high level supports making wiser financial decisions. Millennials like interactive full-motion multimedia, color visuals, and audio and it is also stated that social media has a particularly significant influence on millennials' ability to make decisions [27]. According to the Association of Indonesian Internet Service Providers (2022), DKI Jakarta is the province with the highest internet penetration with a percentage of 83.39 percent. The increasing number of financial education contents in social media can be linked to the financial literacy of millennials in Jakarta. Reference [28] states that the use of social media helps develop financial literacy. The rise of educational videos and programs aimed at Jakarta millennials lead millennials in Jakarta to have more knowledge about finance, thus making them become more aware of good financial behavior.

Age has a negative significant effect on the financial behavior of millennials in Jakarta. This finding of the research is supported by the life cycle theory of savings and consumption by Modigliani and Brumberg where it is stated that people tend to save in their middle age and spend on their older age [29]. The same study also proved that the most senior participants scored the lowest in cutting expenses. The negative link between age and financial behavior of the millennial generation in Jakarta occurs because age growth is not accompanied by financial education. In Jakarta, especially in higher education, courses related to financial management are not yet mandatory according to the Guidelines for the Preparation of the Higher Education Curriculum of

Indonesia (2020) even though it is very crucial for the future. The Statista (2020) also reports that the most social media users in Indonesia are aged 25-34 years and followed by users aged 18-24 years. The rise of financial education content on social media is more accessible to younger people, therefore, younger people have better knowledge of financial information that links them to good financial behavior.

Income has a significant and positive effect on the financial behavior of millennials in Jakarta. The higher the income will result in better and more positive financial behavior. This also applies to the opposite where lower income will result in lower financial behavior. The research of reference [2] that states that people with higher income can be more disciplined in paying their bills on time than those with lower incomes provides evidence in favor of this conclusion. In addition, previous research also found that families with lower incomes are less likely to report saving activity [30]. People with higher income are more likely to be responsible for their financial behavior [5]. This study also found the characteristics of most of the respondents which are millennials in Jakarta who have relatively high income with up to 50% of the respondents having an income of above Rp8,000,000. DKI Jakarta also has the highest provincial minimum wage (UMP) in 2022, which is IDR 4,641,854.00. Consistent with the finding from previous research of reference [5] where it is found that people with higher income are more likely to practice responsible financial behavior because more income means more availability of resources to pay their bills on time, with the high income that millennials in Jakarta have, it affects their financial behavior to be more responsible for their finances, such as to carefully consider when buying something, paying bills on time, and to allocate their income for long-term savings.

V. CONCLUSION

With an index of 80.01%, the results show that Jakarta's millennial population has a high level of financial literacy. Based on the findings of this research, financial literacy, age, and income have significant effect on financial behavior of millennials in Jakarta. Financial literacy has a positive and significant effect on financial behavior of millennials in Jakarta, in line with the previous studies which states that financial literacy has a positive effect on financial behavior [6] [8] [9] [10]. Income also has a positive effect on financial behavior of millennials in Jakarta as supported by the previous studies of reference [2] [5] [30]. Contrastingly, this study found that age has a negative effect on financial behavior of millennials in Jakarta, in line with previous study of reference [29].

In accordance with the results of this study which proves that financial literacy has a significant positive effect on

financial behavior, there are some recommendations that can be given to improve financial behavior.

Millennials in Jakarta to strengthen their financial literacy in order to improve their financial behavior such as by watching or reading more contents related to financial literacy. In particular, millennials must increase their knowledge about the relationship between interest rates and bonds as well as the time value of money. For educators, it is recommended to actively provide education in the field of financial literacy and encourage millennials to have positive financial behavior in order to be able to manage finances appropriately. In addition, the government need to strengthen its programs related to financial literacy to boost public financial literacy in accordance with the Indonesian Financial Literacy National Strategy (SNLKI) 2021-2025.

Future researchers which are interested in examining the impact of financial literacy and demographic factors on financial behavior can consider the following suggestions:

This research only used age and income as a representation of demographic factors, hence, future researchers are suggested to discuss other demographic factors in order to obtain more accurate results.

This research is limited to millennials in Jakarta, therefore, it might be different if the research was conducted elsewhere. Future researchers are suggested to expand the object of research.

It is suggested that future research control additional variables to increase the impact of the independent variable on the dependent variable

In spite of the limitation of this research, the researcher hopes that this research can contribute to the existing literature related to financial literacy and financial behavior.

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Paper 39

Analysis of Product Innovation Implementation at Fast Moving Consumer Goods Company in Indonesia (Case Study at PT. Blue Lunar)

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ICMEM

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Abstract - As one of Fast-Moving Consumer Goods (FMCG) companies in Indonesia, PT. Blue Lunar (a disguised name) believes that innovation is at the core of everything they do as a business. Furthermore, the company thinks that innovation is the key to their business growth. So, they continuously think about how they can provide the most impactful innovation to the consumers. However, over the last 5 years, the total business level of business waste as a percentage of turnover is still higher than their internal parameter which is 0.5% of the sales turnover - equal to a couple of hundreds of billions of rupiah in absolute amount. Innovation failures become one of the biggest contributors to this business waste.

The conceptual framework being used is the innovation funnel which consist of several gates. The conclusions of this research are that in terms of compliance, the product innovation process in the company has been following the standard operational procedures. However, there are several quality problems in performing the process that makes the product innovation does not perform well in the market.

Keywords - Innovation Failures, Business Waste, Analytical Tools for Product Innovation Implementation

I. INTRODUCTION

As one of the FMCG companies in Indonesia, PT. Blue Lunar believes that innovation is at the core of everything they do as a business. Furthermore, they also think that innovation is what keeps them alive and being the key to their business growth. They believe without innovation they might not survive the competition in this industry. So, they continuously think about how they can improve their services and provide the most impactful insights to the customers.

The sales of this innovation are dropping. The sales were not reached as per the volume projection stated in the business case for product innovation. So, it means the product is not well accepted by the market. If we see from the below table, category A has the most failed innovation and so, this research will be more focused on analyzing the implementation of product innovation.

This is also aligned with the business waste number that also comes from this category as the most contributor of the business waste. Over the last 5 years, the total

business level of business waste as a percentage of turnover, remaining at 0.6% to the turnover while their internal parameter aims to go lower than 0.5% to their turnover. This represents absolute couple of hundreds of billions rupiah in average over the past 5 years business waste spent.

BUSINESS WASTE IN IDR BILLION



Fig. 1. Business Waste PT.Blue Lunar for the past 5 years

BUSINESS WASTE AS % TURNOVER

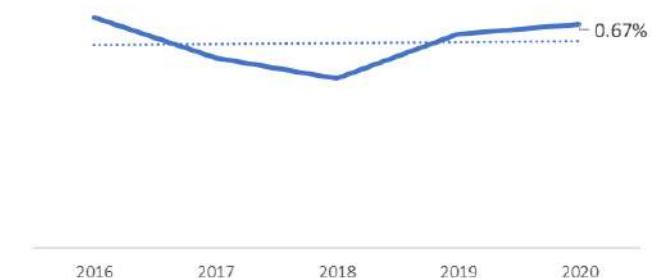


Fig.2. Percentage Business Waste PT.Blue Lunar to Turnover for the past 5 years

The objective of this study is to help the company to analyze the problems mainly in the process of product innovation that contributes to its business waste because it was not successful in the market, so the company can increase the quality of their product innovation to boost their performance in terms of growth.

The field research being done related to the category which its product innovation has most innovation failures which are Project Amplify, Project Yuki, and Project Victoria. The research questions that will be covered in this study are as below:

- How is the implementation of the product innovation process at Blue Lunar?
- Why are there several product innovations that contribute to a business waste to the company?

According to Avlonitis, G. J. 2002, product innovations have an important role to improve long-term financial performance of a company. Product innovations also are a critical driver of business growth, both in terms of revenues and profits.

The researcher is using the framework of innovation funnel which is used by the Category Business Team for any product innovation in the company. The innovation funnel consists of several gates which require several checking and requirement as well as approval before moving on to the next gates. Innovation funnel can be seen as below:

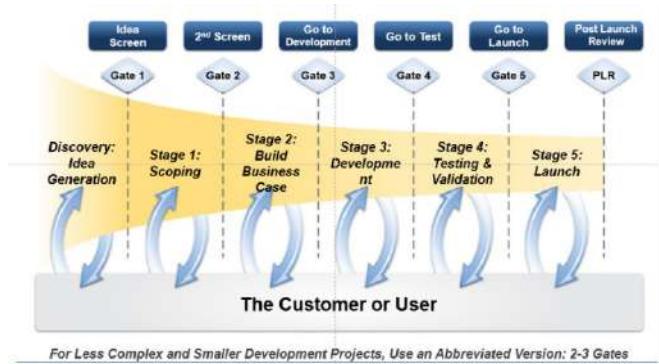


Fig. 3. The Innovation Funnel.

Source: <https://www.sopheon.com/>

1. Idea Screen

The purpose of this gate is to define the project objectives and scope. At Idea Screen, a decision is made as to whether resources are invested to develop the marketing mix (proposition, product, pack, and price), its business potential, and technical feasibility.

2. Second screen

The purpose of Second Screen gate is ultimately a decision as to whether we will invest further into the project, committing resource and capital expenditure to confirm technical capability and complete the marketing mix. The role and responsibilities on this gate are the completion of the Second Screen gate checklist is the responsibility of the Project Leader, with input from the rest of the project team.

The output from this Second Screen Gate is all the checklist for this stage must be completed for the Gatekeeper to come to a decision regarding the release of further funding for the project. Given funding, the project can then move into the Go to Development gate.

3. Go to Development

The purpose of this gate is to decide if the project is ready to move into the Go to Test. This stage of the project's life cycle drives the project towards operational execution and release into the marketplace. The mix must be fully developed and ready at this stage. The roles

and responsibilities are to delivery of the Market Ready document is the responsibility of the Project Leader, with strong input from Marketing, Research and Development and Supply Chain.

4. 4. Go to Test

The purpose is to ensure that the deployment plan is robust and ready for launch. The decision to launch has already been made at Go to Development. Go to Test is a 'ready to execute' checkpoint, ensuring that all local operational activities are complete. Roles and responsibilities are to deliver the Market Ready document is the responsibility of the Project Leader, with strong input from Marketing, R&D and Supply Chain.

5. 5. Post-Launch Review Phase

To ensure that learnings from the project are captured and corrective action plans defined. This includes ways of working, technology, initial trade and consumer feedback and technical /safety action standards. A post project review should be held 3 months post launch of the project (typically this will be a minimum 6-month post Go to Development) An overall Post Launch Review is recommended 12 months post launch and would focus more on the financial aspects of the project delivery.

The product innovation process in the company has been partly following the corporate guideline or standard operational procedures. However, the problems were not in the process checklist but on how the business team ran each list in the gate checklist. The problem more into the connectivity between the marketing mix as well as the product testing to the market via quantitative test.

The researcher proposed several solutions to improve the way business team performing the product innovations process, such as improving the analysis of marketing mix strategies includes selecting the stock keeping unit references, performing bottom-up volume projection from the account, performing the Post-Launch Review in the third and sixth month. To allow this to happen, the business team must have one integrated system for product innovation's performance.

To have a better implementation of the innovation process in the company, the researcher would like to propose the implementation plan according to the researcher's point of view.

II. METHODOLOGY

According to Morse through his book about research design, if the researcher does not know the variables to examine because the topic is new, the theories may not apply with particular sample or group under study and the

subject has never been addressed with a certain sample or group of people in small size, then qualitative research method might be appropriate and useful. Furthermore, qualitative research is an approach for testing objective theories by examining the relationship among variables (Creswell, 2014). Thus, this research will be using qualitative research method.

In this research, the data collection method used are as below:

- Primary data through Interview the key people who have been involved in the product innovation that contributes to the business waste. The interviews were being done to eight people including the Planning Director, Marketing team, Planning team, Consumer Market Insight, and Marketing Finance.
- Secondary data using the documentation being done throughout the innovation gates.

The interview was being done to eight respondents represent their respective functions who were involved in the three projects as the sample taken in this research. The respondent profiling can be seen as below:

No	Respondent	Working Level	Department	Interview Date
1	Respondent 1	Assistant	Finance	6-Nov-20
2	Respondent 2	Director	Supply Chain	18-Nov-20
3	Respondent 3	Manager	Marketing	11-Nov-20
4	Respondent 4	Assistant	Supply Chain	11-Nov-20
5	Respondent 5	Manager	Marketing	13-Nov-20
6	Respondent 6	Assistant	Supply Chain	13-Nov-20
7	Respondent 7	Assistant	CMI	13-Nov-20
8	Respondent 8	Assistant	Finance	20-Nov-20

Fig. 4. List of Respondent Profiling

The interviews were following some protocols as below:

1. Identify the respondents

As mentioned earlier that for this research, the researcher will take the sample for product innovation that contributes to business waste which is Naturalistic and Kobe. And by having the sample in place, the researcher is starting to identify key people who are involved in the product innovation process which are the Marketing, Planning, Consumer Market Insight, and Finance team. The researcher identifies the respondent from the Assistant Manager level, Manager up to the Planning Director level in order to see the pattern of their view towards these two new brands.

2. Set the Interview Schedule

The researcher setting the interview schedule which is in November 2020 based on the availability of the respondents as well. Before setting the interview schedule, the researcher are doing the personal approach to the respondents to explain the objective of the interview

and the research as well as asking their permission and willingness to be interviewed as part of this research.

3. Interview preparation

After agreeing on the interview schedule, the researcher send an invitation to the respondent and prepare a questions list to be asked to the respondent.

4. Conduct the interview

Interviews are done by asking the respondent several questions being prepared by the researcher. The questions are general questions which want to understand the issue happening in the current product innovation. The questions are not trying to intimidate or judge the team who were involved in the product innovation back then.

5. Interview Scripting

As the interviews are done virtually via Microsoft Teams, thus, all the interviews are being recorded and transcribed. The researcher then does the manual transcript and the mapping to find the path of the answers from the respondent.

III. RESULTS

The interview was being done to eight respondents representing their respective functions who were involved in the three projects as the sample taken in this research. The interviews performed by preparing the questions list for the respondents and the interviews were being recorded. Researcher then do the manual transcript and do the word counts to find the problems that were repeatedly mentioned during the interview to do the analysis of the findings using the primary data from the interview. The interview summary can be seen as below figure:

Interview Summary	Total
Volume projection	35
Business waste	21
Ambition/Ambitious	19
Marketing Mix (6Ps) review	12
Assumption put in business case	8
Sell-out was not happening	7
Quantitative before launch	5
FGD (Forum Group Discussion)	5
Competitor analysis	5
No Post-Launch Evaluation	4
Compared to old SKU/SKU reference	4
Capital Expenditure	3
Manual tracker to monitor innovations	2
None innovation success	2
Should not be rushing/in hurry when doing the innovation	2

Fig. 5. Interview Result Summary

Based on the interview results, volume projection was mentioned 35 times throughout the interview which gave the indication this was one of the factors why the product innovations did not work well. Followed by the words of ambition by 19 times and marketing mix review by 12 times. After analyzing the interview results, the major findings of this research are as following:

1. Building Volume Projection number

As the volume projection is very critical to run the rest of the process such as ordering material and pipeline, thus volume projection being set in both brands are relatively aggressive. Based on the data that the researcher obtained, the volume projection is built using Turnover estimator to see from different perspective such as penetration, distribution, market share as well as the stock keeping unit references which only based on theoretical number in the market. However, based on the interview with the respondent, the volume projection being set not considering the bottom-up number from the account to ensure the account will pick the goods based on the volume projection being agreed in the Contract. Also, there were several changes in the volume agreed in the Second Screen Gate versus the volume locked in Go to Development because the business team too optimistic and wanted to make the new brands more sizeable.

2. No quantitative test

Before doing the launch of the product, the Marketing team will do several consumer tests/validations via forum discussion group (FGD) however, there might be a bias in translating the result of the FGD as it tends to be more multi-interpretation. So, the quantitative test is required, however, due to several restrictions such as timing and budget, the quantitative test was not being done by the team in three of the innovations being picked on this research. This might be one of the reasons that the marketing mix does not represent the market needs and wants.

3. Ambition Factor

During the building of volume projection, there is an ambition factor from the leadership team to make the business more sizable. However, the researcher sees it as a gamble if the innovations are not working well, the cost that the company must bear is also huge. So, during the interview with one of the Directors who said that starvation is better than oversupply. So, for piloting, starting small can be an alternative to learn the consumer behavior towards the new product and once the pattern on consumer's behavior and response towards the product then, the business team could consider doing the scale-up.

4. Quality of Marketing Mix Review

From the checklist process, the business team may have done the marketing mix (proposition, packaging, product, price, place, promotion) – called as 6Ps- review, but given the market did not welcome and purchase them, the researcher questioned the quality of the 6Ps review. One of the reasons has been mentioned in the point of number two related to the quantitative test, however, the researcher also sees that the consumer validation towards the idea of the new product was not well-performed given the limited time because the company does not want to lose the momentum.

IV. DISCUSSION

4.1 Project Amplify – Brand Naturalistic

Project Amplify does not conduct the quantitative test in idea screen gate resulting the idea of the marketing mix were not reflecting the real insight from the consumers.

In second screen gate, the marketing mix did not in line one to another. Volume projection was set too high from the previous gate and made the company committed to long year demand. Lastly, this project did not conduct the post-launch review gate to see if the actual volume in line with the business case. After gaining the secondary data during the field research, the relation between the result of Project Amplify and the Innovation Funnel can be summarized in the table as below:

Innovation Gates	Project Amplify
Idea Screen Gate	This project is doing this required step as well as its purpose of the brand and its marketing strategy. However, there was no quantitative test being done
Second Screen Gate	Gate checklist in place. Marketing mix was discussed in more details. However, the marketing mix did not linked one to another. For instance, the proposition is premium but the packaging and place did not represent the premiumness of the product
Go to Development Gate	There's increase in volume significantly from the Second Screen. Place a significant purchase order for more than 1 year demand
Go to Test Gate	The project was having a detailed discussion on the communication plan
Post-Launch Review Gate	Not being done as per guideline

Fig. 6. Relation between Field Research Result and Innovation Gates for Project Amplify

4.2 Project Yuki – Brand Kobe

Project Yuki place a huge investment on the fixed asset because they presume the volume is going to be high demand. This project did not conduct the post-launch review gate to see if the actual volume in line with the business case. After gaining the secondary data during the field research, the relation between the result of Project Yuki and the Innovation Funnel can be summarized in the table as below:

Innovation Gates	Project Yuki
Idea Screen Gate	This project is doing this required step as well as its purpose of the brand and its marketing strategy
Second Screen Gate	No information available
Go to Development Gate	Place a huge investment on the fixed asset
Go to Test Gate	The project was having a detailed discussion on the communication plan
Post-Launch Review Gate	Not being done as per guideline

Fig. 7. Relation between Field Research Result and Innovation Gates for Project Yuki

4.3 Project Victoria – Brand Valentine

Project Victoria does not conduct the quantitative test in idea screen gate resulting the idea of the marketing mix were not reflecting the real insight from the consumers.

In second screen gate, the volume projection was set too high as they used the stock keeping unit which has been existed in the market for 3-5 years. Lastly, this project did not conduct the post-launch review gate to see if the actual volume in line with the business case. After gaining the secondary data during the field research, the relation between the result of Project Victoria and the Innovation Funnel can be summarized in the table as below:

Innovation Gates	Project Victoria
Idea Screen Gate	This project is doing this required step as well as its purpose of the brand and its marketing strategy. However, there was no quantitative test being done
Second Screen Gate	Gate checklist in place. Marketing mix was discussed in more details. However, volume projection using the SKU reference which has been existing in the market for 3-5 years
Go to Development Gate	There's increase in volume significantly from the Second Screen
Go to Test Gate	Not applicable as the project is fast track
Post-Launch Review Gate	Not being done as per guideline

Fig. 8. Relation between Field Research Result and Innovation Gates for Project Victoria

After analyzing the overall result of primary data through interview process as well the secondary data through the documentation being done throughout the innovation gates, researcher finds that several reasons why the innovation failure contributed to the business waste and instead of being the revenue generator, the innovation being a cost burden to the company are as follow:

1. The assumption put in the business case was too ambitious and it is not in line with the market because the sell-out was not happening. The business case

was too optimistic whereas the sell-out was not working because of several problems in the marketing mix (6Ps) strategy because there was not proper consumer validation being conducted.

2. The volume projection was being set using the turnover estimator using the stock keeping unit reference which has been a mature stock keeping unit they have been existing in the market for several years and have had the repeating consumer. Moreover, the business team before discussing to the account whether the account wanted to list the innovation. Furthermore, the consumer validation was not performed properly so the business team interpreted the needs and wants of the consumer could not be represented.
3. In terms of placing the material order, the business team was also too aggressive because they locked the purchase order for the demand for 1 year or more, so when the sell-out was not happening, the business team was liable to the volume commitment which was long-term to the suppliers. This is what has happened for these two projects in this research.
4. The post-launching evaluation was not regularly conducted to see the progress of the product innovations so the mitigation could not be done immediately. Any drop in demand in the market could not be mitigated quickly because the 100 days of the post-launching evaluation were not done by most of the categories. So, when the problems are being captured by the business team, it might be too late already.
5. There was also no integrated system that allowed the business team and related divisions to monitor the performance of the innovations. The current innovations champion role did not cover the end-to-end performance of the innovations so the team could not get the alert or insights when the actual performance did not match what has been planned in the business case.

To improve the product innovation process and based on the interview with the respondent, the researcher proposes a solution as below:

1. Improve in doing the marketing mix (6Ps)
 - a. Proposition

This also needs to be reviewed on how we aim the proposition of our product, and it must be aligned to the other Ps.

b. Packaging

Most of the product innovations using the same packaging compared to the existing stock keeping unit of the company. When consumers recognize it, it will reduce the perception of the product innovation. For instance, Naturalistic brand proposition is a premium brand but then one of their stock keeping unit is using the Ponds tube which the proposition is more into the middle-low brand.

c. Product

Ideally there should be a consumer validation to test the product to see if the product really suits the market

d. Price

Most of the product innovations set a premium price whereas we are disrupting the existing stock keeping unit in the market which the consumers will be easily distracted by lower price compared to the competitor's products.

e. Place

The company also tends to compare the stock keeping unit in terms of their distribution. If the existing product has matured by means, existed in all channels that is because they have existed earlier than us and the demand is there therefore, the channels also demanded for the stock keeping unit to be existed in the channel. By aiming to distribute this to all channels whereas we have not yet assessed its possibility, the volume projected too high/ too optimistic.

f. Promotion

No specific finding in the promotion. The brand ambassador and communication plan are good, the communication channel also very thorough. The business team might need to review the advertising strategy in television commercial is still relevant and worth the budget.

2. The governance to find the stock keeping unit reference is something that needs to be fixed and a quantitative test is a must to validate the assumption.

Several projects setting the stock keeping unit reference to the stock keeping unit that by volume has been mature by means, has been in the market for 3-5 years and they have their loyal and repeat consumer. So, if the product innovation compared to it, it will lead to ambition and make the volume projected in the business case too optimistic.

3. The discussion to account and consumer validation must be done before contract/volume projection being agreed. Most of the cases, volume projection agreed in the contract based on theoretically which using the turnover estimator. The discussion with the account

whether they wanted to list the innovation done close to the Go to Development. So, when the account does not want to list, there is no turning back because the volume projection has been agreed in the contract. From the project that has been done, this creates everything to be pushed. Account being pushed to list it up and when the primary sales had happened and the secondary sales were not, accounts started to push the company back to do the return which cost the company a lot, both financially and operationally. Most accounts might not be able to order the other stock keeping unit because their warehouse is full due to this product innovation.

4. Currently, 100 days Post-Launching Evaluation done after airing which around fifth or sixth month after the first launching, it might be too late because the production and ordering material plan will keep running, so the sooner the problem is captured the better. So, the Post-Launch Review is proposed to be done in the third month and sixth month after the first launching to be able to have corrective action as soon as possible once the volume is not achieved.

5. Innovation project to be simplified but not eliminate the importance of the context being discussed

The current project required at least 9 months to launch new innovations where according to one of the respondents, "If we are strict, 6 months before contract, Idea 3 months previous. It means, we are consciously designing our innovation. The earliest is 9 months which to be honest, it is no longer relevant to the current situation where everything must be agile because competitors launch new brands within months. So, when the governance is being reviewed, there is always an exception to be a fast track which all being fast track and it seems the new normal is fast track". (Respondent 2, Director: 2020)

6. Review the clause with the third party to not bind us especially if the demand is dropped significantly.

The legal and procurement team must help the business team to review the agreement with a third party so with certain extent, the company is not binding if there is any demand drop happening. Or else, the supplier could help to minimize the exposure by selling the materials to their other customer or being used for other products (this can be applied for raw materials). Because currently, because there is no clause or communication about the possibility of demand drop, the supplier sees that as the additional work for them, so they are reluctant to help the company to find the opportunity to minimize the exposure.

7. When the review in third month and sixth month, the secondary sales is not happening, stop the primary sales.

This includes the solution proposed earlier, that basically when the review is being done and there is a symptom that the actual sales are not working as what has been planned, then do not push another primary sale to customer because it will be complex problems in the future, especially on the return activities.

8. Create an integrated system for innovation

Currently, there is no one integrated system to store all the information related to the new product innovation as well as its learnings so everyone in the category could learn from the other categories' lesson learned in hope that other categories will not repeat the same mistakes. Also, the struggles from the other divisions to handle the failure product innovations are not being stored so, the leadership team might not be able to see the direct impact operationally.

9. Make a lean innovation

The product innovation must be effective, lean, and avoiding the heavy investment in the capital expenditure because when it fails, the cost that company should bear is getting bigger as the learning from the Project Yuki – Brand Kobe

10. There should be a central team who monitor the end-to-end innovation progress which covers the end-to-end performance of the innovations.

V. CONCLUSION

After doing the research and obtain the information from the respondents, below are the conclusion of this research by answering the research questions:

1. How is the implementation of the product innovation process at PT. Blue Lunar?

The product innovation process in the company has been partly following the corporate guideline or standard operational procedures. The business team is following the steps because the business leadership team is often running the product innovations. Based on the interview with the respondents, the business team can have 3-4 innovations meeting each month, so in terms of product innovations, they have already known what has been done throughout each gate. So, the problem was not in the process checklist but on how the business team ran each list in the gate checklist. The problem more into the connectivity between marketing mix as well as the product testing to the market via quantitative test.

2. Why are there several product innovations that contribute to a business waste?

There are several problems that contribute to the innovation failure that cost the company such as the assumption put in the business case was too ambitious, volume projection was being set using the turnover estimator not the bottom-up assumption both from the account as well as the consumer validation. The business team was also too aggressive when they locked the purchase order for demand for 1 year or more to avoid the supply problems. Overall, the marketing mix strategy was not being set properly. Moreover, the post-launching evaluation was not regularly conducted to see the progress of the product innovations so the mitigation could not be done immediately. There was also no integrated system that allowed the business team and related divisions to monitor the performance of the innovations. The current innovations champion role did not cover the end-to-end performance of the innovations so the team could not get the alert or insights when the actual performance did not match to what has been planned in the business case.

The management must do the follow up actions to close the gap in the innovations process to reduce the business waste cost to the company so, the cost can be shifted to more productive activities. Most importantly, to make a successful innovation which will strengthen the revenue stream for the company. If the management failed to improve these matters, there is a business risk that the company might lose its competitiveness as they will be hit in both the topline and the bottom line.

To improve the product innovation process and based on the interview with the respondent, the researcher has recommended several improvements and solutions as below:

1. Improve in doing the marketing mix (6Ps) including proposition, packaging, product, price, place, and promotion.
2. The governance to find the stock keeping unit reference is something need to be fixed and quantitative test is a must to validate the assumption
3. The discussion to account and consumer validation must be done before contract/volume projection being agreed
4. The Post-Launch Review is proposed to be done in the third month and sixth month after the first launching
5. Innovation project to be simplified but not eliminate the importance of the context being discussed
6. Review the clause with the third party to not bind us

- especially if the demand is dropped significantly.
7. When the review in third month and sixth month, the secondary sales is not happening, stop the primary sales to avoid any complexity for return in the future.
 8. Create an integrated system for innovation that allow the business team to monitor the performance of the innovation holistically
 9. Make a lean investment innovation to mitigate the risk if the innovation does not work as per planned.
 10. There should be a central team who monitor the end-to-end innovation progress which covers the end-to-end performance of the innovations.

The recommendation for implementation plan has been proposed by the researcher as this topic is also being the scope of internal audit in the company that is still running by the time this business report is created. So, the final implementation plan and timeline will be following the audit report released by the Internal Audit team.

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Paper 40

Formation Of Indonesia Economic Policy Uncertainty
Index For 2014-2021

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract – This research uses information in printed newspapers to create a proxy for measuring uncertainty by forming Indonesia Economic Policy Uncertainty Index for 2014-2021. The index was built by analyzing an extensive data set of articles containing the terms ‘economics’ and ‘uncertainty’ in Bahasa. The text-mining topic modeling method of the Latent Dirichlet was applied to look for terms in the articles that referenced ‘policy.’ Based on the frequency of article publication, an index with a mean of 100 and a standard deviation of 1 was created. The IEPU index topics consist of eight main policy categories; monetary, fiscal, trade, domestic regulation, international regulation, geopolitics, energy/resources, and politics. In addition, its movement can be described based on economic uncertainty events that happened on the timeline. This research also compares the formed index with pre-existing uncertainty indices, namely the VIX index, the GEPU index, and the WUI index for Indonesia.

Keywords - Uncertainty, Policy, Volatility, Text-Mining

I. INTRODUCTION

Uncertainty is an epistemic condition (knowledge) including imperfect or unknown information. Uncertainty is a vague concept that reflects the state of being uncertain in the minds of consumers, managers, and policy-makers about future events. Moreover, it is also a broad concept, including macro and micro phenomena (Ahir et al., 2020). In Layman's terms, conditions that cause uncertainty can be seen as pervasive in 2020 and 2021, such as the US elections, Brexit in the United Kingdom, and those not finalized until mid-2021; the spread of the COVID-19 virus.

Several parties have attempted to use various methods to create a proxy index to explain policy uncertainty and analyze the relationship between market movements and policy uncertainty; both with an approach based on the volatility of the main economic and financial variables (Leahy & Whited, 1996).

One of the most widely used proxies is the Market Volatility Index (VIX) from the Chicago Board Options Exchange (CBOE) for uncertainty in the stock market. However, the weakness of the VIX is that it only captures uncertainty in the stock market – which depends on the liquidity and depth of the stock market, so the VIX can only be relied on in mature markets and industries and is

not easy to replicate in other countries. There is also a news-based NVIX index issued by the Wall Street Journal (Manela & Moreira, 2017). Furthermore, the FEARS Index measures uncertainty based on investor sentiment and text data from internet searches (Da et al., 2011).

Recently, the EPU – Economic Policy Uncertainty Index (hence referred to as the “EPU index”) proposed by Baker et al. (2016) has been frequently mentioned. The EPU Index was established to measure the uncertainty of national economic policies based on the relative frequency of articles in national newspapers containing at least one of three terms related to Economy (E), Policy (P) and Uncertainty (U) and depending on the frequency. Reports in the countries observed can be daily, monthly, or quarterly.

From previous studies, uncertainty has a major impact on investment growth as well as volatility in the economy and financial markets because there have been many attempts to establish uncertainty proxies to help investors and regulators in decision making.

Based on the authors' knowledge, there are currently 26 countries that have already formed their own EPU index, 1 Global Index, as well as several categorical and other indices based on the EPU methodology.

The EPU index is especially helpful for looking at uncertainty in countries with limited alternative uncertainty calculations – as long as there is a newspaper distribution in that country. In addition, the EPU Index is ‘real-time’ and ‘forward-looking’ and can be used as one of the components of calculating leading indicators of the economy.

While several authors have conducted research on the spillover effect of the Global EPU index and other countries on Indonesia, to the authors' knowledge, no one has already built an EPU Index for Indonesia during 2014-2021.

In an effort to establish the EPU index for Indonesia, the authors use the approach taken by Azqueta-Gavaldón (2017), which is to apply machine learning algorithms in particular the Latent Dirichlet Allocation algorithm.

Indonesia's EPU index captures the current state of economic uncertainty from time to time. Thus, the

establishment of the Indonesian Economic Policy Uncertainty Index as one of the leading indicators of the economy is expected to become the basis for further research, especially in the context of policy formation in Indonesia and investment decisions by investors.

II. METHODOLOGY

The data in this research used the articles from news articles taken from printed daily newspapers already transferred into MS Excel forms. The data was selected because the news produced is usually more comprehensive than news from digital media, has less repetition, and covers a longer time span. The period of the data taken was from January 2014 to December 2021. The selection of the time period is adjusted to the availability of data and events that occurred in between.

The news articles were taken from five national newspapers that fulfilled some initial prerequisites; nationally distributed print media, written in Bahasa, publicized daily and available since 2014. After conducting a conventional sampling survey on several respondents, the data used for the research are Media Indonesia, Bisnis Indonesia, Investor Daily, Kompas, and Kontan.

The articles processed contained forms of the term's economy and uncertainty in Bahasa as described in Table 1. The total number of articles associated with terms mentioned on Table 1 from January 2014 to December 2021 was 11.116 articles.

Table 1. Categories of terms searched in articles

Economic	<i>Ekonomi</i>
Uncertainty	<i>Ketidakpastian, ketidaktentuan, ketakpastian, ketidakjelasan, tidak pasti, tidak jelas, tidak tentu</i>

Next, the data (words) were preprocessed by removing stopwords and converting all words into lower case. Additionally, each word is then converted to its stem (e.g. Pemerintah = Perintah) with a total number of 90.450 words in the corpus.

To find the most likely value of topics, the authors calculated the coherence score of words for a different number of topics empirically, which indicates that the most likely number of topics for this corpus is at a minimum of 10 (Fig. 1.) with a coherence score of 0.49.

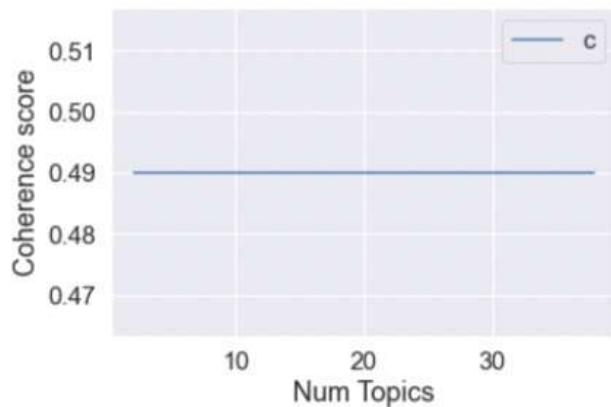


Fig.1. Visualization of coherence score to determine the number of topics

For the text-mining topic modeling method, this research used the Latent Dirichlet Allocation model, which is based on a generative probabilistic approach to infer the distribution of words that define a topic (Blei et al., 2003) and formed ten subtopics, which will be divided into eight main topics (Baker et al., 2016)

In attempting to test the robustness of the index formed, this research compared the IEPU index with the existing uncertainty index; CBOE Volatility Index (VIX), Global Economic Policy Uncertainty Index (GEPU) and World Uncertainty Index for Indonesia (WUI-IDN) by The Economist.

III. RESULTS

Table 2 shows ten topics (column 1) divided into ten policy subcategories (column 3) formed by the LDA model, which is already divided into eight main topics (column 4) together with the list of representative words (column 2).

Table 2. Topic categorization and representative words

Topic	Representative Words	Policy Subcategory	Policy Category
Topic1	<i>Ekonomi, tumbuh, tingkat, indonesia, global, persen, pulih, lambat, dunia, turun, sektor, perintah, kuartal, konsumsi, covid, kerja, investasi, dorong, negara, capai [Economy, grow, level, Indonesia, global, percentage, recover, slow, World, down, sector, order, quarter, consume, COVID, work, investment, encourage, country, achieve]</i>		International Regulation

						Topic	Representative Words	Policy Subcategory	Policy Category
Topic2	Rp, bank, kredit, triliun, tumbuh, perban, PT, turun, biaya, miliar, capai, tingkat, target, Tbk, persero, dana, catat, uang, banding, modal [Rp, bank, credit, trillion, grow, banking, LLC, down, cost, billion, achieve, level, target, public, company, fund, record, money, appeal, capital]	Banking	Domestic Regulation	Topic7	Usaha, bisnis, Indonesia, kembang, pandemi, kerja, COVID, rumah, uang, milik, masyarakat, properti, industri, produk, jual, sektor, laku, asuransi, syariah, butuh [Effort, business, Indonesia, develop, pandemic, work, COVID, home, money, own, people, property, industry, product, sale, sector, sold, insurance, sharia, need]	Pandemic	Domestic Regulation		
Topic3	Bunga, bank, suku, bi, rupiah, indonesia, uang, bijak, nilai, naik, ekonomi, tukar, inflasi, acu, turun, pasar, kuat, moneter, global, sentral [Interest, bank, rate, BI, rupiah, Indonesia, money, wise, value, up, economy, exchange, inflation, reference, down, market, strong, monetary, global, central]	Monetary Policy		Topic8	Industri, Indonesia, eksport, produksi, harga, impor, usaha, juta, bahan, perintah, minyak, tan, energi, sektor, bangun, migas, produk, tingkat, barang, negeri [Industry, Indonesia, export, production, price, import, effort, million, material, order, oil, farming, energy, sector, build, oil & gas, product, level, goods, country]		Trade Policy		
Topic4	Dagang, negara, china, eropa, ekonomi, Inggris, Tiongkok, dunia, Trump, global, Asia, temu, perang, amerika, presiden, sepakat, negaranegara, Uni, Brexit, serikat [Trade, country, China, Europe, economy, UK, world, Trump, global, Asia, meet, war, America, president, agree, states, union, Brexit]	Geopolitics		Topic9	Harga, naik, pasar, kuat, lemah, emas, level, turun, data, minyak, pekan, fed, dolar, analis, dagang, indeks, prediksi, gerak, sentimen, tekan [Price, up, market, strong, weak, gold, level, down, data, oil, week, fed, dollar, analysis, trade, index, prediction, move, sentiment, push]		Energy/ Resources		
Topic5	Pasar, saham, investor, dana, Indonesia, obligasi, asing, investasi, IHSG, utang, Rp, nilai, indeks, hasil, surat, triliun, modal, terbit, masuk, positif [Market, share, investor, fund, Indonesia, obligation, foreign, investment, JCI, debt, Rp, value, index, result, certificate, trillion, capital, issue, income, positive]	Financial Market	Domestic Regulation	Topic10	Politik, presiden, orang, Indonesia, pilih, masyarakat, negara, dunia, hidup, pimpin, ubah, milik, Jokowi, sosial, jalan, hadap, hasil, ajar, publik, warga [Politics, president, person, Indonesia, choice, people, country, world, life, lead, change, own, Jokowi, social, way, face, result, teach, public, citizen]		Politics		
Topic6	Perintah, pajak, menteri, anggar, terima, investasi, kerja, negara, atur, bijak, triliun, ekonomi, Rp, usaha, APBN, daerah, target, belanja, bangun, UU [Order, tax, minister, budget, accept, investment, work, country, regulate, wise, trillion, economy, Rp, effort, state budget, regional, target, spending, build, law]		Fiscal Policy						

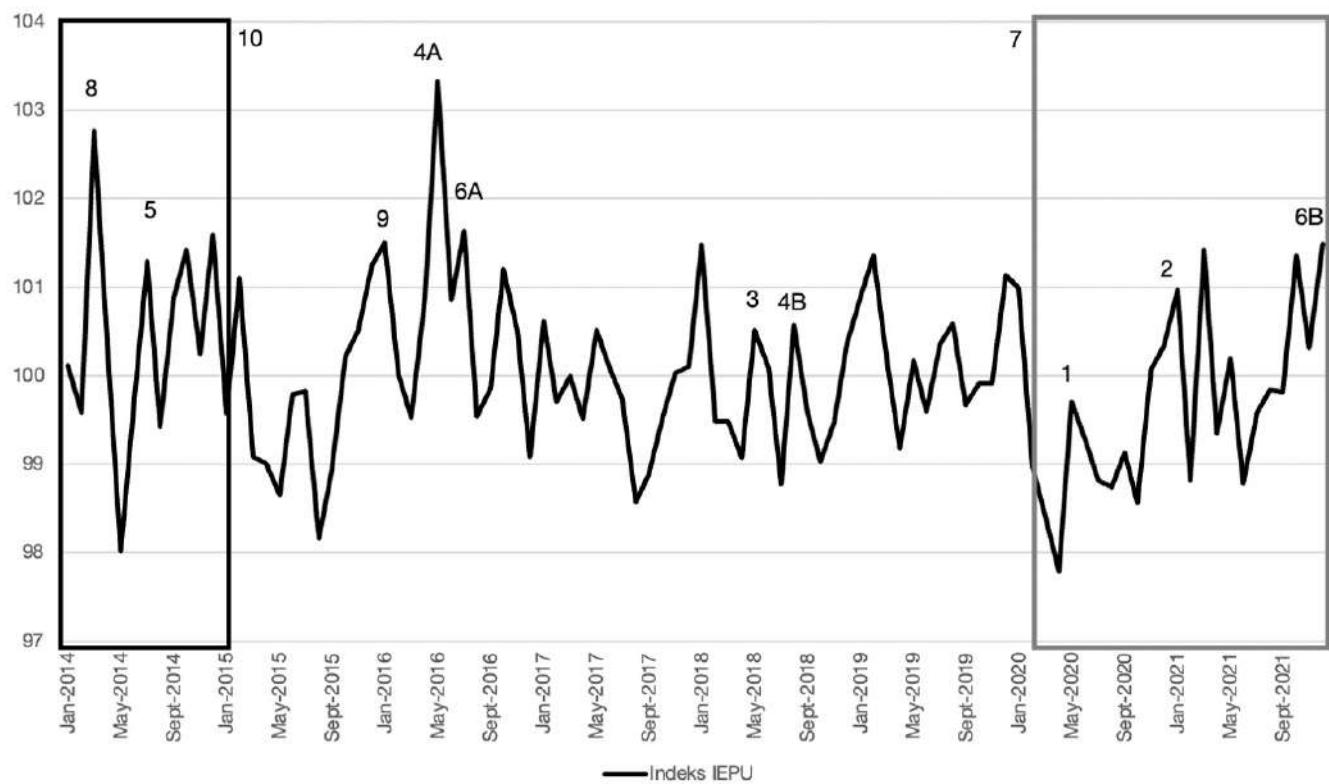


Fig. 2. The Indonesia Economic Policy Uncertainty for 2014-2021

IV. DISCUSSION

A. The Indonesia Economic Policy Uncertainty Index

Fig. 2 shows the Indonesia Economic Policy Uncertainty Index (IEPU) from January 2014 to December 2021. As previously stated, the index can be categorized into ten topics, inferring it to the IEPU index based on the category in Table 2.

Starting in 2014, articles on economic uncertainty in Indonesia at the beginning of the year reported sluggish exports (Topic 8, Trade) which had dragged on since 2013. However, in the same year, articles on economic uncertainty also discussed the topic of elections (Topic 10, Politics). In 2014, there was an election for President and Vice President, taking place in July 2014 (Topic 5, Domestic Regulation – Capital Market) when Joko Widodo and Jusuf Kalla declared victory – which was responded positively by the Indonesian capital market.

In the first quarter of 2016, articles of economic uncertainty were occupied by Saudi Arabia's decision to reduce oil prices to \$29 per barrel and increase production (Topic 9 – Energy, Resources). Thus, this event was followed by an adjustment in the price of subsidized fuel.

In the second quarter of 2016, due to the United Kingdom's referendum on the decision to leave the European Union, often known as Brexit, there were signs that economic

uncertainty was rising (Topic 4, Geopolitics, 4A). Meanwhile, in the third quarter of 2016, the Tax Amnesty policy was the main cause of a major increase in economic uncertainty. (Topic 6, Fiscal, 6A).

Mid 2018, articles on economic uncertainty were filled with the Fed's policy to gradually increase its interest rate until it reached 2.5% at the end of 2018. This event was then followed by an adjustment to Bank Indonesia's interest rate benchmark (Topic 3, Monetary). July 2018, the trade war between the United States and China began when each country enacted the increment of import duty on imported goods by up to 25%.

The years 2020 and 2021 can be regarded as the pandemic year (Topic 7, Domestic Regulations – Pandemic) due to the March 2020 confirmation of the first case in Indonesia. Since then, most of the articles on Indonesian economic uncertainty are related to mitigating the impact of the pandemic by restricting social activities. However, as this was a case of a global pandemic (Topic 1, International Regulations), most of countries affected also at the time, regulate international movement by closing flights to and from several countries with a high rate of COVID-19 spread.

One of the domestic regulations to tackle the impact of the COVID-19 pandemic issued by the government was the relaxation of banking credit as a countercyclical measure for the weakening economy (Topic 2, Domestic Regulations - Banking). In addition to the financial sector,

the government also has various policies to encourage economic growth during the pandemic, as well as increasing budgeted state spending for the prevention and treatment of COVID-19. However, nearing the end of 2021, the article of economic uncertainty that appears was whether the pandemic response budget should be continued until 2022 or not (Topic 6, Fiscal, 6B.)

B. Relationship Between IEPU And Other Uncertainty Index

Table 3 shows a correlation analysis between the IEPU index and other uncertainty indices; the VIX Index, the GEPU Index, and the WUI-IDN index. The results revealed that the correlation of the IEPU Index with the VIX Index and the GEPU Index showed a negative correlation. Meanwhile, the correlation of the IEPU Index with the WUI-IDN index showed a positive correlation.

Table 3. Correlation value of IEPU index and other economic uncertainty index

Comparison Index	IEPU - Category	Correlation Value
CBOE VIX	IEPU index	-0.2625
	IEPU index - International Regulation	0.1384
Global EPU	IEPU index	-0.1679
	IEPU index - International Regulation	0.3223
WUI - IDN	IEPU index	0.225

Considering that the first two indices are global indices, a positive correlation value was obtained when comparing the two indices to the IEPU index on topics related to international regulation. Based on these results, it is necessary to further examine the spillover of international volatility on economic uncertainty in Indonesia.

Meanwhile, there was a positive correlation between the WUI-IDN and economic articles from The Economist that focus on Indonesia. This is sufficient evidence of the IEPU index's robustness.

V. CONCLUSION

This research tries to show an establishment of an economic uncertainty index for Indonesia, based on articles from local newspapers using Bahasa Indonesia with a text mining analysis approach, in particular the unsupervised machine learning method of the Latent Dirichlet Allocation model.

The unsupervised nature of this method allows us to classify large data into topics, which can then be matched with the categories built by Baker et al. (2016). In addition, the movement within the index can also be easily described by events that happened within the timeline.

From the correlation test, we see that there is a negative

correlation between the IEPU index and another global economic uncertainty index. However, when compared with another economic uncertainty index that focuses on Indonesia, it shows a positive correlation, which we believe can be seen as enough evidence of the robustness of the IEPU index.

ACKNOWLEDGMENT

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Paper 41

Risk Management in Collateral Credit: A Case Study in PT. Jamkrida (Perseroda) Sulawesi

Ayudyah Dian Imasari, Safaat Aufahasan Adzka, Himma Aflakhassifa, and Gagaring Pagalung

ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract – This paper presents an exploratory study regarding risk management in collateral credit organizations, particularly in PT. Penjaminan Kredit Daerah (Jamkrida) (Perseroda) Sulawesi Selatan. The term collateral credit is unfamiliar to some people, even though the role of collateral credit is essential for MSMEs before applying for credit loans in a specific bank. In addition, the organization's role in supporting MSMEs is in line with their vision, contributing to regional economic development. This paper aims to determine the business process of collateral credit organization; to identify its risk management application; to determine the internal and external analysis of the business in order to achieve public awareness regarding collateral credit. The research methodology used in this paper is a qualitative approach using by exploratory case study method. The data was collected from the interview with board of commissioners and collateral credit manager. Furthermore, the analysis of TOWS strategy resulted in an in-depth analysis of PT. Jamkrida's business's development purpose.

Keywords – Collateral Credit; MSMEs; Regional Economic Development; Risk Management.

I. INTRODUCTION

Since the COVID-19 pandemic has struck, many micro, small, and medium-sized enterprise (MSMEs) were affected for its business disruptions. The essential in MSMEs business is the external funding supported by banks [1]. Before applying for its external funding request, collateral is one of crucial document after its financial reporting. The role of collateral is to make sure that loan term contracts is at low risk to smooth the process of credit acquisition for MSMEs [2].

In line with the background of the importance of collateral for credit acquisition, PT. Penjaminan Kredit Daerah (Jamkrida) (Perseroda) Sulawesi Selatan (Sulsel) which is located in Makassar, Indonesia offers services of issuing the collateral for local MSMEs. It is a Regional-Owned Enterprise with the objectives of providing MSMEs collateral credit for loan purposes that considered to meet two of the objectives, which are: (a) to support local MSME to receive their external funding; and (b) to increase regional economic development.

Collateral is used by banks as its defense to reduce their

exposure to loss [3]. The role of PT. Jamkrida (Perseroda) Sulsel is as an intermediary for MSMEs business owner and banks. From the side of business owner, it smooths the process of external funding from banks, on the other hand, from the side of banks, PT. Jamkrida (Perseroda) Sulsel will provide loan guarantees to business owners without having to worry about experiencing losses in the future. In addition, from the side of government, collateral credit organization can be considered as an option to increase the awareness of regional economic improvement.

PT. Jamkrida (Perseroda) Sulsel has an organization consisting of President Commissioner, Board of Commissioners (Independent), and Board of Directors as their top management level. Under the BoD, internal auditors, collateral expert staffs, and department managers are responsible for the middle management.

In 2020, PT. Jamkrida (Perseroda) Sulsel has faced significant growth for its customers, especially for the collateral credit products it has issued. An increase of 200% from 2019, indicating that there were significant customers who have known PT. Jamkrida (Perseroda) Sulsel functions in increasing business funding. Therefore, the objective of this paper includes (a) to determine the business process of collateral credit organization; (b) to identify its management application risk (c) to determine the internal and external analysis of the business in order to achieve public awareness regarding collateral credit.

II. METHODOLOGY

The research questions include the following:

1. How is the business process of PT. Jamkrida (Perseroda) Sulsel?
2. How is PT. Jamkrida (Perseroda) Sulsel overcome its risk management?
3. What are the elements of PT. Jamkrida (Perseroda) Sulsel in developing its business?

This paper uses qualitative research by exploring a case study phenomenon of collateral credit, particularly in PT. Jamkrida (Perseroda) Sulsel. The primary data was collected from the interview with board of commissioners and the collateral credit manager.

III. RESULTS

Business Process of PT. Jamkrida (Perseroda) Sulsel

The business process of PT. Jamkrida (Perseroda) Sulsel is started from the agreement with business partner, such as Bank, Rural Bank, Revolving Fund Management Institution, Coop, Reinsurance or Re-warranty, Project Owners, Contractors, etc. There are three products offered to its customer, which are collateral credit, surety bond, and counter bank guarantee. Each product has different business process in issuing the collateral certificates.

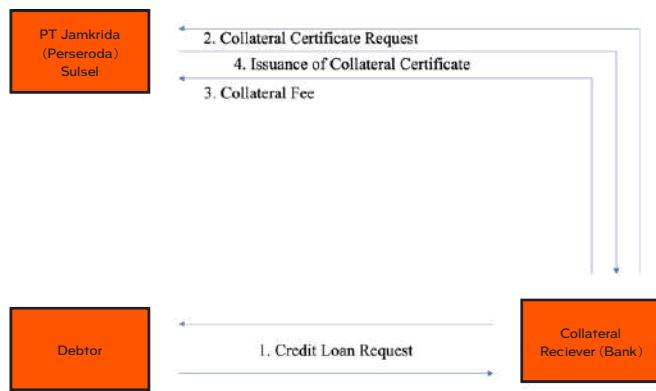


Fig. 1. Collateral Credit Certificate Issuance Process

Fig. 1 shows the certificate issuance process for collateral credit products. There are two systems in the collateral credit certificate issuance, which are automatic cover, and case by case. Automatic cover is a credit guarantee provided automatically based on the agreement if the collateral value is low or small. On the other hand, case by case, a guarantee is provided based on submission by collateral receiver (Bank) if the collateral value is high or large. The debtor will apply credit loan to the bank, and bank as the recipient of collateral letter will do the first screening for the debtor's eligibility for credit loan to secure the credit acquisition that will be given to the debtor. Bank will pay the collateral fee to PT. Jamkrida (Perseroda) Sulsel before the issuance of the collateral certificate. There are three types of credit that can be guaranteed, which are consumptive, productive, and constructive.

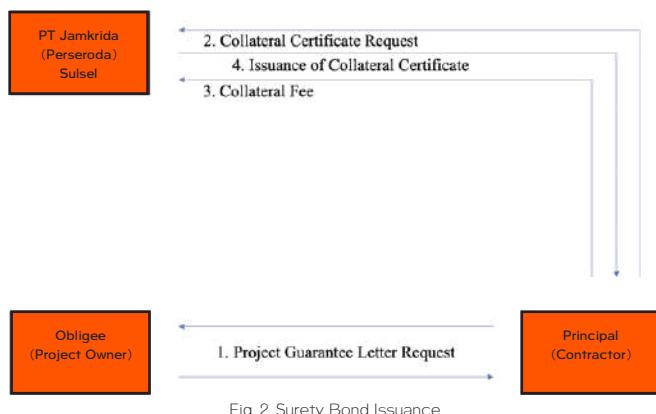


Fig. 2 shows the surety bond issuance process. Surety bond means a bond that guarantees the performance of the principal (contractor) and obligee (project owner). The warranties given to the principal (contractor) for project-related activities that are provided or to be provided by the obligee (project owner). There are four types of surety bonds issued, which are bid bonds, performance bonds, advance payment bonds, and maintenance bonds.

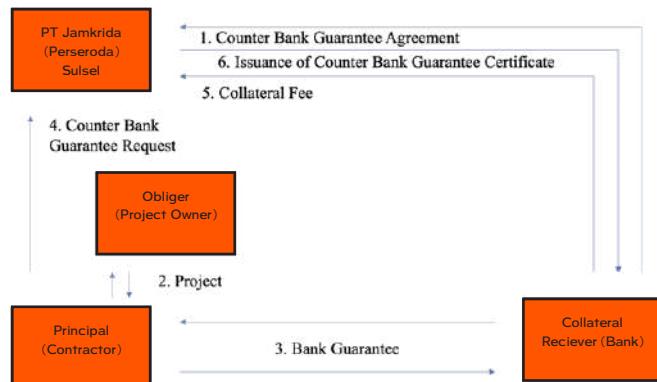


Fig. 3. Counter Bank Guarantee Agreement

Fig. 3 shows Counter Bank Guarantee Agreement. Counter Bank Guarantee Agreement is a bank guarantee provided that is issued by the bank against the guarantee of the work performance of principal (contractor). The type of counter bank guarantee issued are the same as surety bond. The bank will request for counter bank guarantee agreement with PT. Jamkrida (Perseroda) Sulsel, while the principal and obligee are working on a project agreement. The principal will request a bank guarantee for Bank and PT. Jamkrida (Perseroda) Sulsel. Before issuing, the counter bank guarantee certificate to the recipient of collateral, bank must pay a collateral fee to PT. Jamkrida (Perseroda) Sulsel.

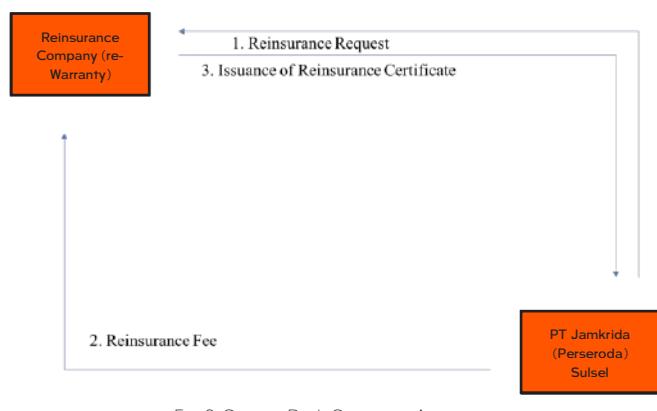


Fig. 3. Counter Bank Guarantee Agreement

Fig. 4 shows the reinsurance process, a guarantee on collateral provided by PT. Jamkrida (Perseroda) Sulsel against the debtor or contractor. The collateral was made by PT. Jamkrida (Perseroda) Sulsel will be re-guaranteed to the re-warranty or reinsurance company, which will be assumed that the risk is getting smaller. However, the guaranteed fee will also be decreased. It is usually done

for large projects that involve a large value of collateral credit to avoid high risk of failed-to-pay and result in credit claims by collateral recipients.

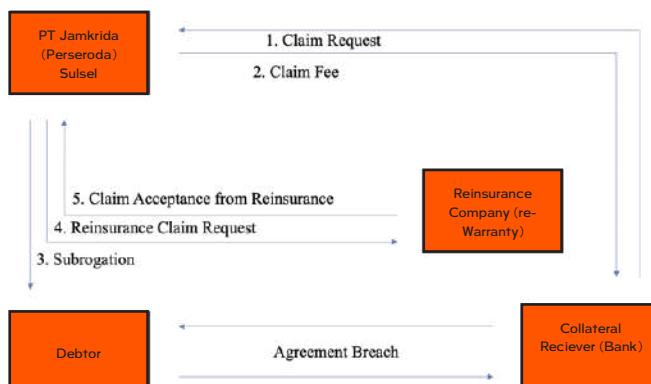


Fig. 5. Claim Process

Compensation to guarantee recipients (such as Banks and Revolving Fund Management Institution) that caused failed-to-pay (debtor) for previously guaranteed credit agreements. The claims will be requested by collateral recipients (in this case Banks) towards PT. Jamkrida (Perseroda) Sulsel, then they will pay the claim according to the agreement. There will be transition of rights to collectives from guarantee benefits to guarantee companies, known as subrogation. After the subrogation process is complete, PT. Jamkrida (Perseroda) Sulsel will submit a reinsurance claim to the reinsurance company. The reinsurance company will accept the request and pay for the claim made by the collateral recipient.

IV. DISCUSSION

Risk Management

Credit risk is the danger when counterparts or borrowers of formal financial institutions cannot fulfil their commitments in line with predetermined terms, which may result in a risk of borrower default [4]. However, according to Angelucci et al., credit helps business expand, by providing (potential) borrowers confidence in their decision-making, and helps families manage risk and financial flows (liquidity) [5]. Credit taking by start-up or MSMEs is considered moderate to high risk as the business performance information given to the financial institution business performance will not be enough to be understood and analyzed in the short period. Formal financial institutions are particularly keen in lending money to SME owners who can provide some of the initial money or collateral that is valuable enough to secure the loan [6]. In addition, by giving low-income families access to financing, it will help promote self-reliance and improve their economic well-being. Therefore, the collateral credit is considered to be able to support the MSMEs and contribute to the regional economic development, which is in line with PT. Jamkrida (Perseroda) Sulsel company's objectives.

There is a positive relationship between credit loan risk and collateral [7]. Risk is linear to volatility, uncertainty, complexity, and ambiguity. The turbulence and dynamics of change in the volatility lead to visionary plan as a way to reduce risk. PT. Jamkrida (Perseroda) Sulsel use the strategy of reinsurance, or re-warranty to share high risk. Re-warranty business model is unfamiliar to the local business environment, however, PT. Jamkrida (Perseroda) Sulsel understand that the higher risk, the higher return the company will get. To avoid uncertainty of the outcome, a deep understanding can reduce the risk of unpredictable outcomes. PT. Jamkrida (Perseroda) Sulsel faced numerous complexities in their business due to multiple interdependencies among business competition. The product offered by PT. Jamkrida (Perseroda) Sulsel has clear targeted customer. Clarity is the right approach to address the complexity of the risk. In addition, risk happens because of ambiguity, some unclear perspectives of the scenarios lead to asymmetric information [8], which in the case of PT. Jamkrida (Perseroda) Sulsel will be harmed the organization. Agility, the ability to adapt faster in any situation and scenario might reduce the risk that could harm PT. Jamkrida (Perseroda) Sulsel.

TOWS Analysis

Table 1 - TOWS STRATEGY ANALYSIS

Internal Factor Analysis		Strengths	Weakness
External Factor Analysis			
Opportunities	Threats	SO Strategies	WO Strategies
O1 - Growth Market		SI1: High number of 'consumptive' collateral credit customer SI2: Readiness of the cap/constrain budgeting SI3 - Clear targeted customer	W1 - Small amount cashflow W2 - As market challenger only in district area W3 - Fluctuating achievement realization
O2 - Rebound economy post covid-crisis		SO2: Focus on improving brand awareness through product differentiation	WO1: Improving capabilities of human capital, specially towards business development WO2: Strengthen business partnership with Bank Sulsel
O3 - Low number of similar business			
Threats		ST Strategies	WT Strategies
T1 - Uncertain condition of micro businesses		ST1: Rate stabilization for inflation's value of money protection	WT1: Reducing insolvency trend by tighten screening process
T2 - Rising inflation (2022)			
T3 - Insolvency trend in crisis			

Table 1 shows PT. Jamkrida (Perseroda) Sulsel's SWOT analysis along with the recommended strategy to develop its business. Since the business model of PT. Jamkrida (Perseroda) Sulsel is unique, it has clear target customer by offering its product. It has high number of 'consumptive' collateral credit customers which guarantees the multifunction collateral. On the other hand, due to the payment cycle of PT. Jamkrida (Perseroda) Sulsel, it has small amount of cashflow which is considered not beneficial for them. Besides, the target achievement fluctuates every month. From the threat side, the trend of failed-to-pay or agreement breach remains the core threat of PT. Jamkrida (Perseroda) Sulsel. However, since it has low number of similar business models, the market growth is the opportunities as it could lead to dominate the regional market in Sulawesi Selatan.

In collateral credit risk, understanding the information profoundly is essential to avoid the uncertainty of risk. Based on the 2020 annual report of PT. Jamkrida (Perseroda), the human capital consists of collateral, marketing, and financing department. Meanwhile, recruiting business development and planning talent for PT. Jamkrida (Perseroda) will benefit them because they must do research and eventually forcing them to understand its business environment. In addition, PT. Jamkrida (Perseroda) Sulsel should focus on their product differentiation as the product offers focus on issuing collateral credit certificates.

Based on the 2022 Sulawesi Selatan Regional's Economy Report, the inflation rate of Sulawesi Selatan is 2.40% which is in the range of the national limit (3%) of the inflation rate. The setting of interest rate of credit loan in Sulawesi Selatan decrease to 10.12% for working capital in government's bank [9]. As the objective of PT. Jamkrida (Perseroda) Sulsel to develop regional economy by supporting working capital for MSMEs, the strengthening of working capital is need to be supported by the regional policy to set the interest rate so that the rising of inflation will not be the challenge to PT. Jamkrida (Perseroda) Sulsel [10].

Based on Yoshino and Taghizadeh-Hesary's research stated that the limitation of credit loan for small firms usually has high interest rate with complex requirement procedures that need collateral to receive the loan [11]. Therefore, in the perspective of collateral credit provider company, tight screening process of the potential customer is needed to avoid agreement breach. It will avoid failed-to-pay company to the financial institutions, or in surety bond case, the principal violates its term, and vice versa. The screening process of the potential customer should be tightened by requesting and analyzing the business before issuing collateral certificates. As risk is in line with uncertainty, it needs deep understanding to predict the potential outcomes.

V. CONCLUSION

The principle of risk stated the higher the risk, the higher the return. Risk happened because of the volatility, uncertainty, complexity, and ambiguity of a certain situation. PT. Jamkrida (Perseroda) Sulsel has different business model which helps the organization to overcome its risk. PT. Jamkrida (Perseroda) Sulsel tends to share its risk to reinsurance company even the return is low. The strategy used by PT. Jamkrida (Perseroda) Sulsel is to receive a stable income with stable risk. In addition, to develop its business, it is recommended that PT. Jamkrida (Perseroda) Sulsel to recruit and create a business development and planning department for organization's future prospect.

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Paper 42

CAPM Test In Indonesian Stock Market Using Mean-Variance Optimal Portfolio As Market Return Proxy

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ICMEM

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Abstract - This study examines the validity of the market return proxy used in the standard capital asset pricing model (CAPM) test. CAPM describes the relationship between the risk and the expected return of assets and is commonly used to estimate the cost of capital and measure the performance of a managed portfolio. Unfortunately, the value-weighted Jakarta Composite Index (JCI) used in standard CAPM tests as a market proxy fails to satisfy the assumption of mean-variance efficiency. Using mean-variance portfolio optimization of Kompas 100, LQ45, and IDX30 index components to generate an optimal portfolio to be used as a market proxy in CAPM, this study shows that "optimal beta" has less error in the expected return prediction than "market beta". Furthermore, the presence of bias in the value-weighted market index is also analyzed. The findings of this study imply that the mean-variance efficient portfolio from the portfolio optimization process should replace the value-weighted market index as a market proxy for CAPM's beta estimation.

Keywords – CAPM, portfolio optimization, market proxy

I. INTRODUCTION

CAPM is introduced by Sharpe (1964) and Lintner (1965) to determine the theoretically appropriate required rate of return of assets, particularly common stocks. Since its introduction, CAPM has gained widespread acceptance from academics and professionals, resulting in a Nobel Prize for Sharpe in 1990.

Although CAPM gains strong support in early research (Jensen, 1968 and Jensen, 1969), subsequent researches document poor empirical evidence (Blume and Friend, 1973; Fama and MacBeth, 1973; Fama and French, 1992). Most explanations for the model's failure focus on irrational pricing and the market proxy approach (Fama & French, 2004). The irrational pricing argument states that investors' decisions are fundamentally affected by psychological biases, hence irrational pricing which is not captured by market beta in CAPM exists systematically. This explanation stems from the failure of CAPM to explain expected returns on stocks sorted according to characteristics, such as earning-prices ratio (Basu, 1977), size (Banz, 1981) and book-to-market ratio (Chan, Hamao, and Lakonishok, 1991). As a result, CAPM is expanded to multifactor models with additional "common risk factors" to increase the explanatory power. For instance, the

three-factor model (market risk, size, and value premium) by Fama and French (1992), the four-factor model (market risk, size, value, and momentum premium) by Carhart (1997), and the five-factor model (market risk, size, value, profitability, and investment premium) by Fama and French (2015).

In contrast, market proxy arguments draw inspiration from Roll's (1977) critics. Roll focuses on the theoretical aspect of CAPM regarding the validity of the value-weight market portfolio proxy used in standard CAPM tests. In addition to the mean-variance efficient requirement, Roll states that the market proxy must be a "true market portfolio" which includes all marketable assets beyond common stocks. Nevertheless, Stambaugh (1982) finds that the addition of several asset classes beyond common stocks to market proxy does not result in a better approximation of the original CAPM. The problem of market proxy continues to become a debate among academics. Currently, value-weight market proxies used in most CAPM tests are assumed to be on the mean-variance frontier.

This research uses optimal portfolios resulting from mean-variance portfolio optimization as a market proxy in CAPM, replacing value-weight market indices which are commonly used. We believe value-weight market indices to be inefficient since inherent biases such as large-cap bias (Chaudhary and Bakhshi, 2021) and price floor policy (capping the minimum price of 50 for the main index) in Jakarta Composite Index (JCI) components cause value-weight market portfolio's risks and returns to be below efficient frontier. Contrary to most research, we do not focus on the irrational pricing approach which tests for the multifactor model because CAPM is impeccable from an academic viewpoint. Furthermore, various studies document inconsistency in multifactor model test results, such as the tendency of other risk premiums such as size and momentum to be time-varying and disappear after academic publications (McLean and Pontiff, 2013).

The scope of this study is limited to the Indonesian stock market and the analysis consists of monthly data. The main objective of this study is to compare the CAPM performance by using the value-weight market index (represented by JCI) and mean-variance optimal portfolio (represented by the optimized Kompas 100, LQ45, and IDX30 index) as a market proxy. The usage of the value-weighted market index as a market proxy in CAPM regression will result in "market beta". On the other hand,

the usage of the optimal portfolio as the market proxy will result in "optimal beta". Both variables will be substituted to beta in CAPM to produce different predictions of the expected return. The performance of CAPM is measured by the accuracy of its prediction. To carry out the objective, we will compare the prediction errors of "market beta" and "optimal beta".

Key assumptions for this research are built upon earlier studies. Assumptions for the mean-variance model on which the foundation of CAPM is built are all investors are rational, risk-averse, and utility maximizers (Markowitz, 1952). Furthermore, assumptions for Sharpe-Linter CAPM are unrestricted borrowing and lending at the risk-free rate and homogenous expectations (Sharpe, 1964; Lintner, 1965). In addition, it is also assumed that CAPM completely explains returns, and no other risk premiums besides market risk premium are added to the original model, so that intercept (alpha) value is zero.

We hope this research can significantly contribute to a gap in current research since most contemporary studies tend to focus on the development of multifactor models. In addition, the amount of research that discusses the market proxy problem of CAPM in the emerging market, including Indonesia, is rare, hence this research can open the door for further research in this field.

II. METHODOLOGY

2.1 Data and Sample Selection

This research uses the monthly adjusted close price of Kompas 100, LQ45, and IDX30 index components. These monthly price data are then converted to monthly returns to be used as inputs to the portfolio optimization process. Stock components of Kompas 100, LQ45, and IDX30 index consist of 94, 45, and 30 stocks, respectively. Six stocks are excluded from Kompas 100 index due to incomplete data. Stock components are from the index's list for the August 2021-January 2022 period as referenced by the IDX website. The period of data selection is from 1 February 2017-1 January 2022. In total, there are 10,140 data for monthly stock returns from 169 stock tickers. Furthermore, the yield of a 10-year Indonesian government bond is used as a risk-free rate proxy in CAPM. For the value-weighted market proxy, the monthly return of JCI is used. This research uses Matlab 2021 for portfolio optimization and CAPM regression.

The return data are arranged into sample groups according to the choice of a market index (Kompas 100, LQ45, and IDX30) and periodicity (2, 3, 4, and 5 years).

2.2 Research Methodology

The methodology for this research can be divided into mean-variance portfolio optimization and the CAPM regression process for finding beta and expected return. In the portfolio optimization process, the mean and variance of return data of each index's components are computed for finding the mean of return, risk, and weight of the portfolio in the efficient frontier. The problem of portfolio selection for constructing an efficient frontier diagram can be formulated as risk minimization, expressed as a set of equations in the matrix form:

$$\min_{\omega} \frac{1}{2} \omega' \Sigma \omega \quad (1)$$

$$\text{s.t. } \omega' \mu = r_p \quad (2)$$

$$\omega' \mathbf{1} = 1 \quad (3)$$

where ω_i is the weight of stock i , $\text{cov}(r_i, r_j)$ is the covariance of return of stock i and j , $E(r_i)$ is the expected return of stock i , and r_i , r_j and r_p are the return of stock i , j , and portfolio p , respectively.

By solving a set of Equations 1-3, a set of portfolios with minimum variance for various levels of r_p can be calculated by quadratic programming and plotted as the portfolio points along the efficient frontier. These portfolios are also known as mean-variance efficient portfolios.

Located in the efficient frontier, there are two global optimum portfolios: maximum Sharpe ratio (MSR) and minimum variance (MV) portfolio. Each portfolio has different criteria for optimality. MSR portfolio has a global optimum Sharpe ratio among the efficient portfolios and is connected with a line to the risk-free rate point in the vertical axis (Fabozzi et al, 2015). The MSR portfolio can be found directly by solving the maximization problem in the form of a matrix:

$$\max_{\omega} \frac{\mu' \omega - r_f}{\sqrt{\omega' \Sigma \omega}} \quad (4)$$

where μ is the mean of return, r_f is the risk-free rate and $r_f R^N$. On the other hand, the MV portfolio has a global minimum risk among the efficient portfolios and is located at the bottom end of the efficient frontier, or in the curve's "nose".

The results of portfolio optimization are the mean of return, risk, and weight of the optimal portfolio for each sample. Next, the weight of each component will be multiplied by its price to construct an optimal portfolio index. The returns of the optimal portfolio index are calculated and then used in CAPM regression for finding beta. The specification for CAPM is the original model as proposed by Sharpe (1964) and Lintner (1965) expressed as:

$$E[r_i] = \alpha_i + r_f + \beta_i \times (E[R_m] - r_f) \quad (5)$$

where $E[r_i]$ is the expected return of stock i , α_i is the model's intercept, β_i (beta) is the systematic risk, and $E[R_m]$ is the expected return of market proxy. Market beta is obtained by using JCI returns as a market proxy in CAPM. On the other hand, optimal beta is obtained from using MSR and MV portfolio returns of Kompas 100, LQ45, and IDX30 in each periodicity as a market proxy. Furthermore, CAPM regression is carried out again using optimal beta and market beta to find the expected return.

2.3 Error Estimation

The results of the expected return from optimal beta and a market beta of CAPM regression are compared to the realized return of each stock component. The error of prediction (ε) is expressed as:

$$\varepsilon = E(r_i) - r_i \quad (6)$$

where $E(r_i)$ and r_i is the expected return and realized return, respectively, for stock i . From a set of error data, the mean-squared error (MSE) is expressed as:

$$MSE = \frac{1}{n} \sum_{i=1}^n (Y_i - \hat{Y}_i)^2 \quad (7)$$

where Y_i and \hat{Y}_i is the actual and average value of component i . The value of MSE for each sample will be used to judge the performance of CAPM for each sample of optimal and market beta.

The commonly accepted assumption is that the usage of the optimal portfolio from mean-variance optimization as a market proxy must not result in better CAPM performance, than simply using a value-weighted market index. The null hypothesis is developed from this assumption, which states that the error of CAPM prediction by using a value-weighted market proxy is lower than or equal to the error resulting from the usage of an optimal portfolio as a market proxy. On the other hand, the alternative hypothesis must support the notion the error of CAPM prediction by using a value-weighted market proxy is higher than the error resulting from the usage of an optimal portfolio as a market proxy.

III. RESULTS

3.1 General Descriptive Statistics

The descriptive statistics of monthly returns of Kompas 100, LQ45, and IDX30 components for the full period of February 2017-January 2002 are given in Table 1.

Table 1 - DESCRIPTIVE STATISTICS OF THE MONTHLY RETURNS OF INDEX COMPONENTS

	Kompas 100	LQ45	IDX30
Min	-0,575	-0,555	-0,506
Max	1,295	1,000	1,000
Mean	0,012	0,013	0,015
Median	-0,004	0,000	0,003
Stdev	0,144	0,129	0,122
Skewness	1,543	0,972	1,200
Kurtosis	8,345	4,976	5,966
N	5640	2700	1800

Furthermore, monthly returns of Kompas 100, LQ45, IDX30, and JCI calculated from their monthly index prices are obtained for February 2017-January 2022. The results are presented in Table 2:

Table 2 - DESCRIPTIVE STATISTICS OF THE MONTHLY RETURNS OF INDEX PRICES

	Kompas 100	LQ45	IDX30	JCI
Min	-0,201	-0,214	-0,203	-0,168
Max	0,111	0,117	0,117	0,094
Mean	0,002	0,002	0,002	0,005
Median	0,006	0,009	0,008	0,007
Stdev	0,050	0,051	0,050	0,041
Skewness	-1,075	-1,301	-1,182	-1,248
Kurtosis	3,647	4,775	4,124	4,312
N	60	60	60	60

3.2 Data Results

The results of the portfolio optimization process are the efficient frontier diagrams that depict a set of mean-variance efficient portfolios. The efficient frontier diagrams for Kompas 100, LQ45, and IDX30 optimization results in 2-5 years period of returns are shown in Figures 1-12.

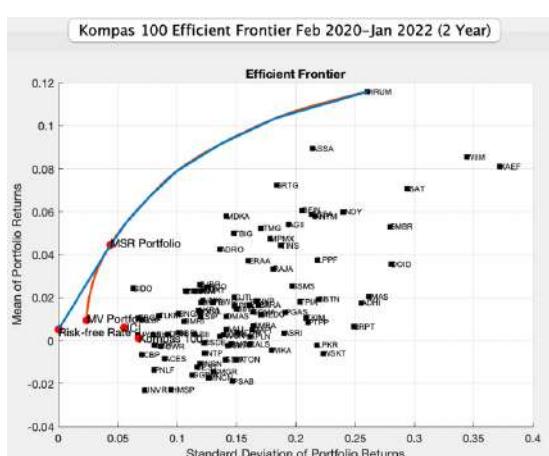


Fig. 1. Efficient frontier diagram for 2 years sample of Kompas 100 optimization results.

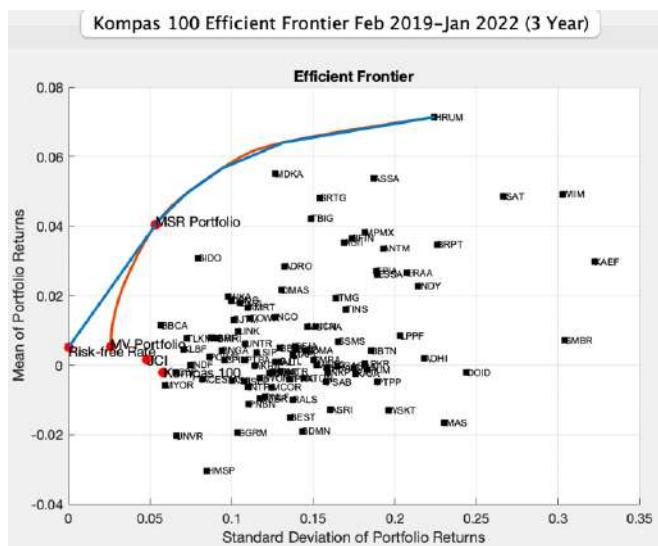


Fig. 2. Efficient frontier diagram for 3 years sample of Kompas 100 optimization results.

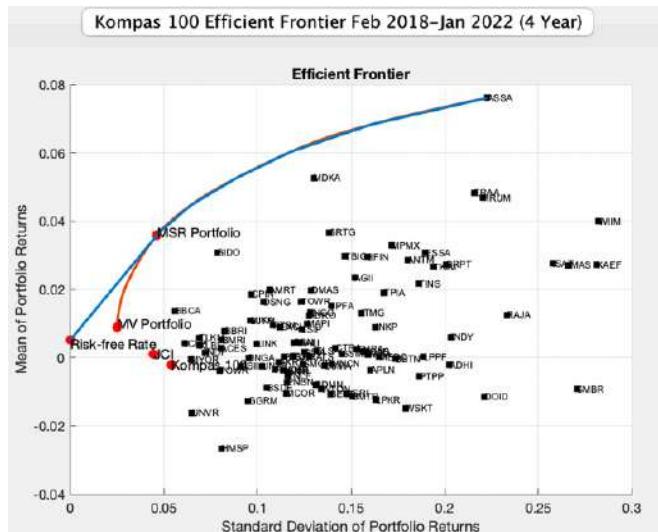


Fig. 3. Efficient frontier diagram for 4 years sample of Kompas 100 optimization results.

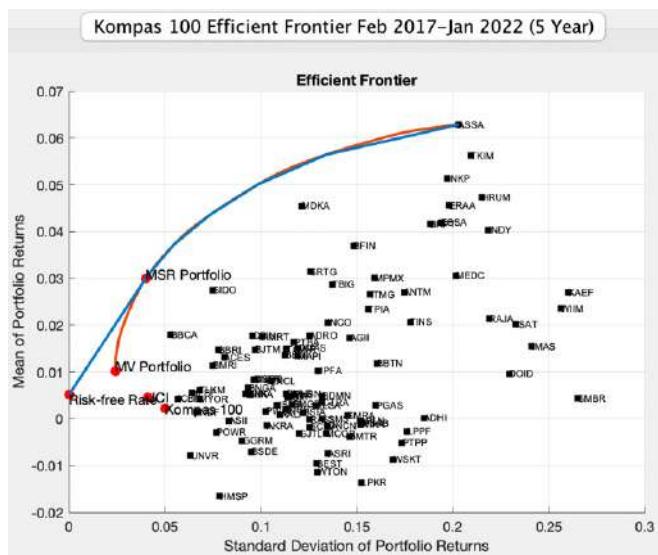


Fig. 4. Efficient frontier diagram for 5 years sample of Kompas 100 optimization results.

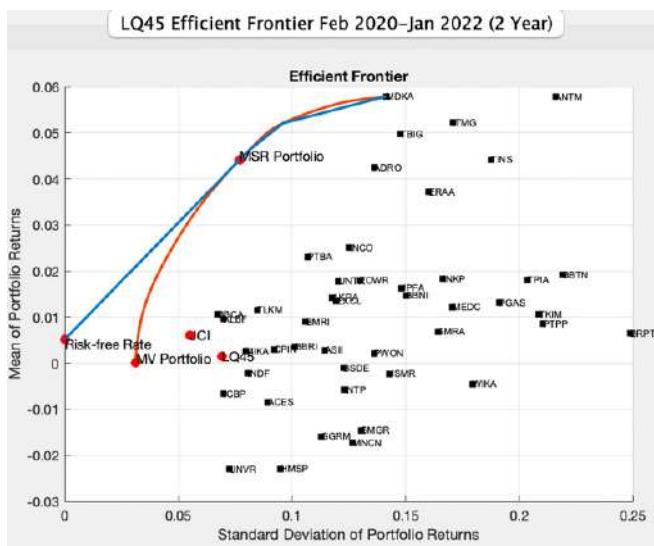


Fig. 5. Efficient frontier diagram for 2 years sample of LQ45 optimization results.

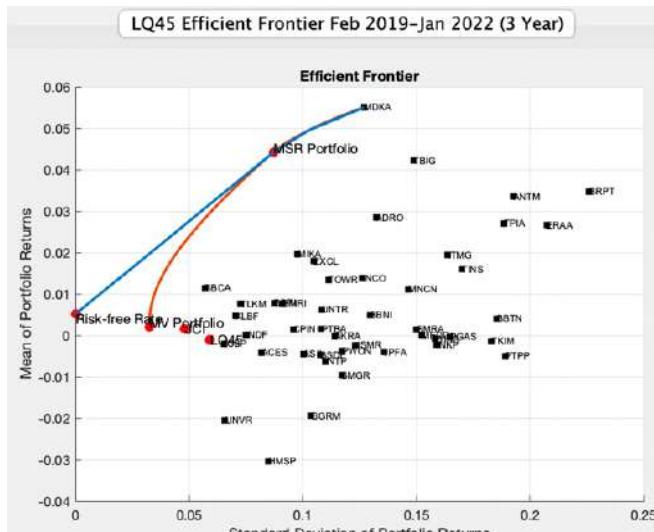


Fig. 6. Efficient frontier diagram for 3 years sample of LQ45 optimization results.

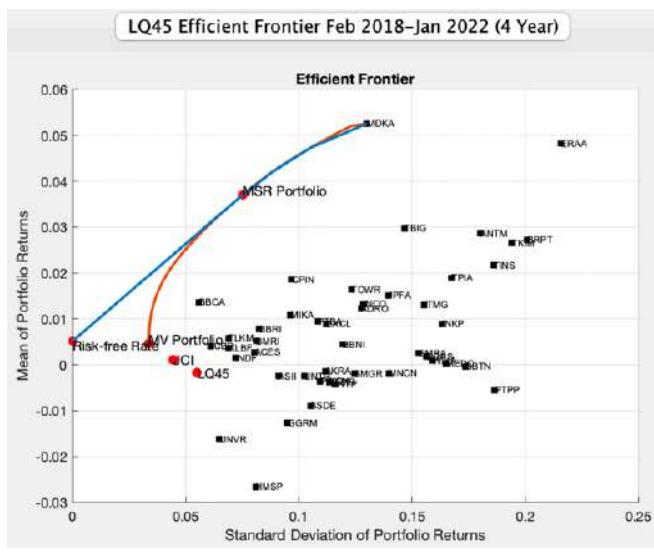


Fig. 7. Efficient frontier diagram for 4 years sample of LQ45 optimization results.

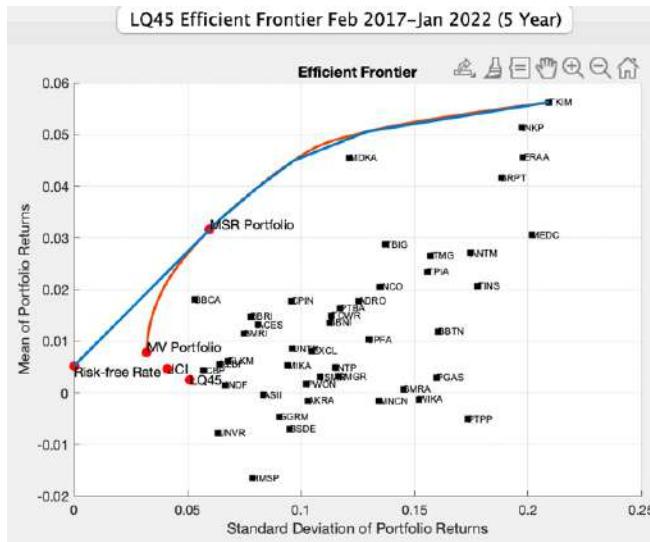


Fig. 8. Efficient frontier diagram for 5 years sample of LQ45 optimization results.

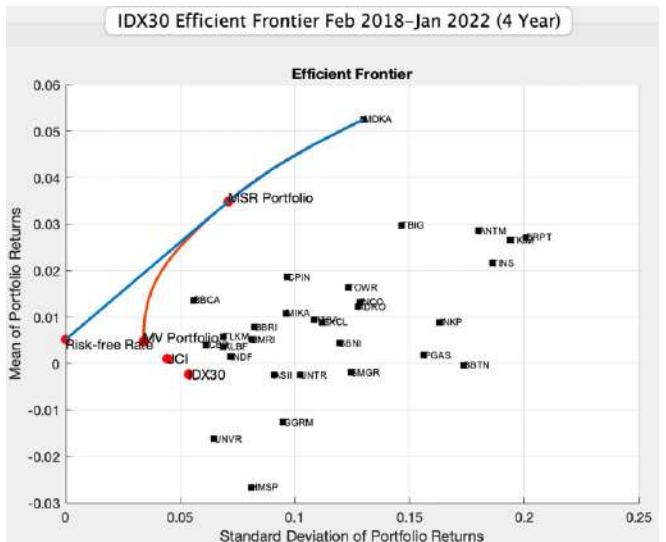


Fig. 11. Efficient frontier diagram for 4 years sample of IDX30 optimization results.

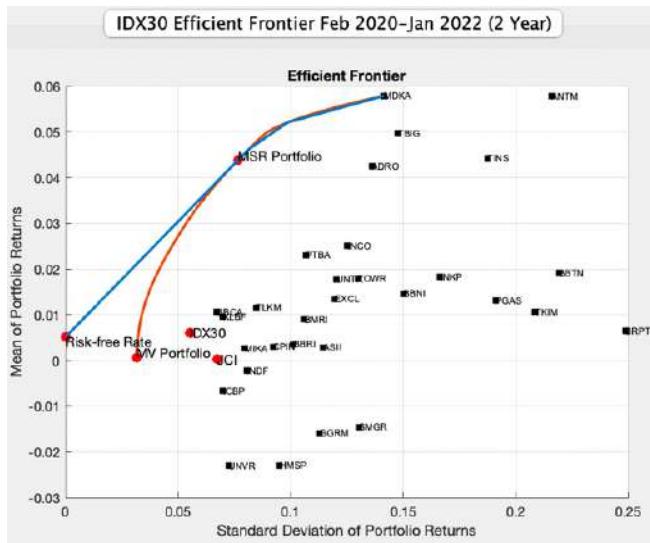


Fig. 9. Efficient frontier diagram for 2 years sample of IDX30 optimization results.

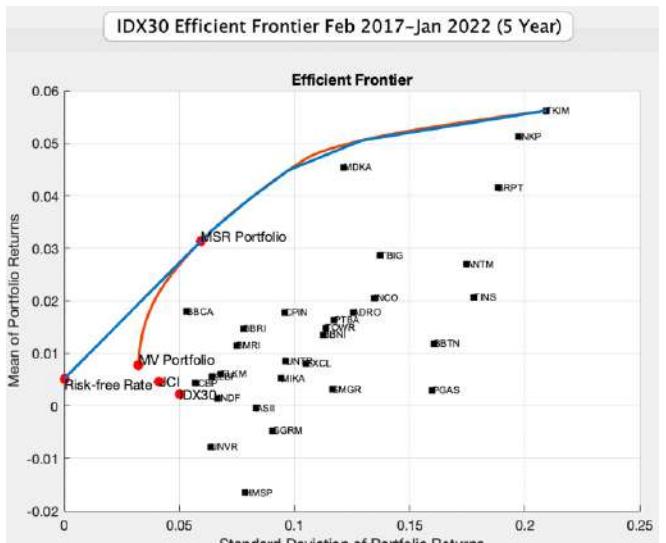


Fig. 12. Efficient frontier diagram for 5 years sample of IDX30 optimization results.

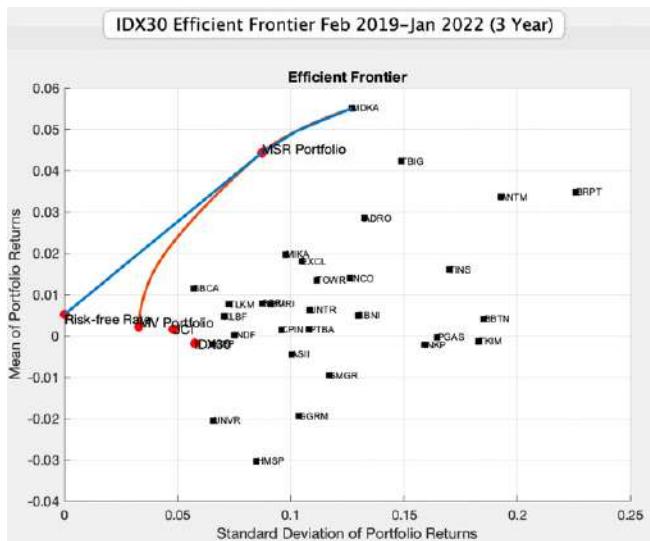


Fig. 10. Efficient frontier diagram for 3 years sample of IDX30 optimization results.

Figure 1-12 shows the mean of return and risk of Kompas 100, LQ45, and IDX30 index components, index returns, and JCI. As the theory suggests, the MSR and MV portfolio are both located at the efficient frontier. The MSR portfolio is connected to the point of the risk-free rate, while the MV portfolio is located at the bottom end of the efficient frontier. The mean of returns of index components is located below the efficient frontier. In addition, the mean of return and risk of unoptimized value-weighted indices (Kompas 100, LQ45, and IDX30) and JCI are located below the efficient frontier, indicating their inherent inefficiency in the mean-variance framework. Although these efficient frontier diagrams represent only a small portion of samples, we believe that the construction of efficient frontier diagrams by using other samples will result in a similar location for the value-weight index, since the portfolio weight is not optimal.

Following the results of portfolio optimization, the mean of return and risk of each optimal portfolio will be compared to that of a value-weighted portfolio for each index in Table 3-5.

Table 3 - THE MEAN OF RETURN AND RISK OF OPTIMAL PORTFOLIO AND VALUE-WEIGHTED PORTFOLIO OF KOMPAS 100

	MSR		MV		Kompas 100	
	Return	Risk	Return	Risk	Return	Risk
2 year	0,045	0,044	0,009	0,024	0,001	0,068
3 year	0,040	0,053	0,005	0,026	-0,002	0,058
4 year	0,036	0,046	0,009	0,025	-0,002	0,054
5 year	0,030	0,040	0,010	0,024	0,002	0,050
Mean	0,038	0,046	0,008	0,025	0,000	0,057

Table 4 - THE MEAN OF RETURN AND RISK OF OPTIMAL PORTFOLIO AND VALUE-WEIGHTED PORTFOLIO OF LQ45

	MSR		MV		LQ45	
	Return	Risk	Return	Risk	Return	Risk
2 year	0,044	0,077	0,000	0,031	0,001	0,069
3 year	0,044	0,087	0,002	0,032	-0,001	0,059
4 year	0,037	0,075	0,005	0,034	-0,002	0,055
5 year	0,032	0,060	0,008	0,032	0,002	0,051
Mean	0,039	0,075	0,004	0,032	0,000	0,059

Table 5 - THE MEAN OF RETURN AND RISK OF OPTIMAL PORTFOLIO AND VALUE-WEIGHTED PORTFOLIO OF IDX30

	MSR		MV		IDX30	
	Return	Risk	Return	Risk	Return	Risk
2 year	0,044	0,077	0,001	0,031	0,000	0,067
3 year	0,044	0,087	0,002	0,033	-0,002	0,057
4 year	0,035	0,071	0,005	0,034	-0,002	0,054
5 year	0,031	0,059	0,008	0,032	0,002	0,050
Mean	0,039	0,073	0,004	0,033	0,000	0,057

Looking at the average returns and risk for the 2-5 years sample period, the average returns of the value-weighted index are always lower than that of the optimal portfolios (MSR and MV). On the other hand, the risk is higher. The average risk in the MV portfolio is the lowest compared to that of MSR and the value-weighted index. In contrast, the average return in the MSR portfolio is the highest compared to that of MV and the value-weighted index. The results in Table 3-5 are consistent with the location of the respective portfolios in the efficient frontier (Figure 1-12).

In CAPM regression, the returns of the optimal portfolio index for each Kompas 100, LQ45, and IDX30 will be substituted for the returns of the market proxy to obtain the optimal beta. On the other hand, the returns of JCI will be substituted for the returns of the market proxy in CAPM to obtain the market beta. The statistics of beta values for each stock component and their measure of statistical significance (p-value) are provided in Tables 6-8.

Table 6 - THE RESULTS OF BETA AND P-VALUE OF OPTIMAL AND VALUE-WEIGHTED MARKET PROXY IN KOMPAS 100 COMPONENTS

	MSR					
	Beta			p-value		
	Min	Max	Mean	Min	Max	Mean
2 years	-0,37	1,89	0,68	0	0,81	0,09
3 years	-0,18	2,11	0,48	0	0,81	0,13
4 years	-0,02	1,56	0,64	0	0,56	0,07
5 years	0,14	2,57	1,20	0	0,32	0,03
Total	-0,37	2,57	0,75	0	0,81	0,08
MV						
	Beta			p-value		
	Min	Max	Mean	Min	Max	Mean
	-0,87	3,09	0,93	0	0,93	0,19
3 years	-0,86	3,31	1,22	0	0,95	0,11
4 years	-0,63	2,92	1,25	0	0,85	0,08
5 years	-0,69	3,93	1,32	0	0,91	0,07
Total	-0,87	3,93	1,18	0	0,95	0,11
JCI						
	Beta			p-value		
	Min	Max	Mean	Min	Max	Mean
	-1,16	3,62	1,62	0	0,80	0,04
2 years	-0,80	4,06	1,64	0	0,76	0,03
3 years	-0,51	3,59	1,61	0	0,71	0,03
4 years	-0,35	3,75	1,57	0	0,67	0,02
Total	-1,16	4,06	1,61	0	0,80	0,03

Table 7 - THE RESULTS OF BETA AND P-VALUE OF OPTIMAL AND VALUE-WEIGHTED MARKET PROXY IN IDX30 COMPONENTS

MSR					
	Beta			p-value	
	Min	Max	Mean	Min	Max
2 years	-0,12	1,60	0,66	0	0,75
3 years	-0,09	1,30	0,49	0	0,77
4 years	0,01	1,27	0,52	0	0,47
5 years	0,09	2,47	0,79	0	0,26
Total	-0,12	2,47	0,61	0	0,77
MV					
	Beta			p-value	
	Min	Max	Mean	Min	Max
2 years	-0,46	2,92	0,73	0	0,89
3 years	0,09	2,57	1,11	0	0,44
4 years	-0,39	0,99	0,49	0	0,90
5 years	0,04	1,68	0,91	0	0,45
Total	-0,46	2,92	0,81	0	0,90
JCI					
	Beta			p-value	
	Min	Max	Mean	Min	Max
2 years	0,17	2,91	1,32	0	0,26
3 years	0,12	2,86	1,32	0	0,30
4 years	0,21	3,01	1,31	0	0,15
5 years	0,22	2,77	1,30	0	0,10
Total	0,12	3,01	1,31	0	0,30
JCI					
	Beta			p-value	
	Min	Max	Mean	Min	Max
2 years	0,17	2,91	1,32	0	0,26
3 years	0,12	2,86	1,32	0	0,30
4 years	0,21	3,01	1,31	0	0,15
5 years	0,22	2,77	1,30	0	0,10
Total	0,12	3,01	1,31	0	0,30

Based on data in Table 6-8, the average beta values for JCI are higher than those resulting from optimal market proxies. In general, the average beta values are significant ($p\text{-value}<0,1$) except for those resulting from MV optimal portfolio as a market proxy for the periodicity of 1-2 years. The higher beta values for the JCI proxy imply that the usage of a value-weighted market proxy tends to overestimate the risk of individual securities. These findings lead to higher expected returns from CAPM prediction, as will be explained in the later section.

The expected returns resulting from optimal and market beta in CAPM regression are later compared to the realized returns of each stock to obtain the prediction errors. Next, the MSE values for all stock components of Kompas 100, LQ45, and IDX30 are presented in Tables 9-11.

Table 8 - THE RESULTS OF BETA AND P-VALUE OF OPTIMAL AND VALUE-WEIGHTED MARKET PROXY IN IDX30 COMPONENTS

MSR					
	Beta			p-value	
	Min	Max	Mean	Min	Max
2 years	-0,12	1,60	0,66	0	0,75
3 years	-0,09	1,30	0,49	0	0,77
4 years	0,01	1,27	0,52	0	0,47
5 years	0,09	2,47	0,79	0	0,26
Total	-0,12	2,47	0,61	0	0,77

Table 9 - MEAN-SQUARED ERRORS FOR ALL STOCK COMPONENTS IN KOMPAS 100 PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,008838	0,008851	0,009019
3 year	0,008811	0,008894	0,009021
4 year	0,008839	0,008925	0,009013
5 year	0,008935	0,008911	0,008991
Mean	0,008856	0,008895	0,009011

Table 10 - MEAN-SQUARED ERRORS FOR ALL STOCK COMPONENTS IN LQ45
PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,007289	0,007307	0,007441
3 year	0,007297	0,007332	0,007442
4 year	0,007282	0,007361	0,007446
5 year	0,007346	0,007315	0,007430
Mean	0,007304	0,007329	0,007440

Table 11 - MEAN-SQUARED ERRORS FOR ALL STOCK COMPONENTS IN IDX30
PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,004082	0,004027	0,004129
3 year	0,004064	0,004083	0,004131
4 year	0,004049	0,004001	0,004127
5 year	0,004096	0,004036	0,004118
Mean	0,004073	0,004036	0,004126

The results in Table 9-11 show that the usage of MSR and MV portfolio as market proxy consistently produces better prediction than that of a value-weighted market index (JCI) in Kompas 100, LQ45, and IDX30 samples. For Kompas 100, the MSR portfolio has the lowest average MSE value (0,008856) than that of the MV portfolio (0,008895) and JCI (0,009011). Similarly, the MSR portfolio in LQ45 samples also has the lowest average MSE value (0,007304) than that of the MV portfolio (0,007329) and JCI (0,007440). On the other hand, different results are obtained for IDX30 samples. Their average MSE value for the MV optimal portfolio is 0,004036, which is the lowest between that of the MSR portfolio (0,004073) and JCI (0,004126).

Furthermore, a more objective comparison will be conducted for 30 selected stock components of Kompas 100, LQ45, and IDX30 in Tables 12-14. Those stock components have similar inclusion to the three indices. The purpose of this analysis is to exclude the possible bias caused by different stock components of Kompas 100, LQ45, and IDX30.

Table 12 - MEAN-SQUARED ERRORS FOR 30 SELECTED STOCKS IN KOMPAS 100
PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,004034	0,004039	0,004129
3 year	0,004057	0,004095	0,004131

4 year	0,004056	0,004112	0,004127
5 year	0,004108	0,004094	0,004118
Mean	0,004064	0,004085	0,004126

Table 13 - MEAN-SQUARED ERRORS FOR 30 SELECTED STOCKS IN LQ45
PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,004040	0,004031	0,004129
3 year	0,004064	0,004072	0,004131
4 year	0,004042	0,004062	0,004127
5 year	0,004089	0,004034	0,004118
Mean	0,004059	0,004050	0,004126

Table 14 - MEAN-SQUARED ERRORS FOR 30 SELECTED STOCKS IN IDX30
PORTFOLIO OPTIMIZATION

	MEAN-SQUARED ERROR		
	MSR	MV	JCI
2 year	0,004082	0,004027	0,004129
3 year	0,004064	0,004083	0,004131
4 year	0,004049	0,004001	0,004127
5 year	0,004096	0,004036	0,004118
Mean	0,004073	0,004036	0,004126

The results in Table 12-14 show that the MSE values for using an optimal portfolio as a market proxy are still lower than that for using the JCI value-weighted index. In Kompas 100 sample, the average MSE value for MSR portfolio (0,004064) is 1,5% lower than that of JCI (0,004126) and is 0,5% lower than that of MV portfolio (0,004085). On the other hand, the performance of prediction is better for the MV portfolio in LQ45 and IDX30 samples. In LQ45 sample, the average MSE value for MV portfolio (0,00405) is 1,84% lower than that of JCI (0,004126) and is 0,2% lower than that of MSR portfolio (0,004059). In IDX30 sample, the average MSE value for MV portfolio (0,004036) is 2,2% lower than that of JCI (0,004126) and is 0,9% lower than that of MSR portfolio (0,004073). Overall, the MV portfolio in IDX30 samples has the lowest average MSE value (0,004036) among all other samples tested.

Since the MSE values of CAPM prediction are consistently lower with optimal beta resulting from the usage of the MSR and MV optimal portfolio as a market proxy than with market beta resulting from value-weighted JCI as a market proxy, then the null hypothesis in this research is firmly rejected.

Based on the test result, the sample that produces the best CAPM performance is the 5-year sample of MV

optimization in the LQ45 index. The sample has a low MSE value (0,004034), yet the p-value of the optimal beta is still significant (average p-value of 0,049). On the other hand, some samples produce lower MSE values, but their average beta values are not statistically significant. The index choice seems to not affect the CAPM performance, although Kompas 100 has relatively higher MSE values in their samples. Nevertheless, the average MSE of the MSR portfolio in the Kompas 100 sample (0,004064) has a higher value than that of the IDX30 sample (0,004073). Similarly, the choice of periodicity does not correlate with the results of MSE, but the periodicity of 1-2 years produces average beta values that are not significant (average p-value>0,1). On the other hand, MV portfolios seem to have lower values of MSE in LQ45 and IDX30 samples, yet in Kompas 100 index, their MSE values are higher.

The consistent results of higher prediction errors for market beta from value-weighted JCI proxy might be caused by a presence of bias in the portfolio composition. To test this hypothesis, the statistics of expected returns from CAPM calculation by using market beta and optimal beta are presented in Tables 15-17. In addition, the p-values of paired t-tests (with the hypothesized mean difference set to zero) between each pair of the mean expected returns resulting from the use of optimal and market beta in CAPM regression are presented in Table 18.

Table 15 - THE EXPECTED MONTHLY RETURN OF KOMPAS 100 OPTIMAL PORTFOLIO AND JCI

MSR				
	Min	Max	Mean	Stdev
2 years	0,0043	0,0097	0,0068	0,0009
3 years	0,0047	0,0102	0,0063	0,0009
4 years	0,0051	0,0089	0,0067	0,0008
5 years	0,0055	0,0113	0,0080	0,0015
Total	0,0043	0,0113	0,0069	0,0012

MV				
	Min	Max	Mean	Stdev
2 years	0,0031	0,0125	0,0074	0,0019
3 years	0,0031	0,0131	0,0081	0,0019
4 years	0,0037	0,0121	0,0081	0,0018
5 years	0,0035	0,0145	0,0083	0,0019
Total	0,0031	0,0145	0,0080	0,0019

JCI				
	Min	Max	Mean	Stdev
2 years	0,0024	0,0138	0,0090	0,0021
3 years	0,0033	0,0149	0,0091	0,0021
4 years	0,0039	0,0137	0,0090	0,0020
5 years	0,0043	0,0141	0,0089	0,0019
Total	0,0024	0,0149	0,0090	0,0020

Table 16 - THE EXPECTED MONTHLY RETURN OF THE LQ45 OPTIMAL PORTFOLIO AND JCI

MSR				
	Min	Max	Mean	Stdev
2 years	0,0048	0,0090	0,0068	0,0010
3 years	0,0050	0,0083	0,0064	0,0008
4 years	0,0051	0,0079	0,0063	0,0006
5 years	0,0053	0,0107	0,0073	0,0014
Total	0,0048	0,0107	0,0067	0,0010

MV				
	Min	Max	Mean	Stdev
2 years	0,0040	0,0124	0,0071	0,0018
3 years	0,0054	0,0106	0,0078	0,0013
4 years	0,0056	0,0118	0,0080	0,0013
5 years	0,0052	0,0107	0,0075	0,0011
Total	0,0040	0,0124	0,0076	0,0014

JCI				
	Min	Max	Mean	Stdev
2 years	0,0056	0,0129	0,0087	0,0018
3 years	0,0054	0,0131	0,0087	0,0018
4 years	0,0057	0,0134	0,0087	0,0018
5 years	0,0057	0,0130	0,0087	0,0017
Total	0,0054	0,0134	0,0087	0,0018

Table 17 - THE EXPECTED MONTHLY RETURN OF IDX30 OPTIMAL PORTFOLIO AND JCI

MSR				
	Min	Max	Mean	Stdev
2 years	0,0049	0,0090	0,0067	0,0011
3 years	0,0050	0,0083	0,0063	0,0009
4 years	0,0052	0,0082	0,0064	0,0008
5 years	0,0054	0,0111	0,0070	0,0015
Total	0,0049	0,0111	0,0066	0,0011

Total	0,0049	0,0111	0,0066	0,0011
MV				
	Min	Max	Mean	Stdev
2 years	0,0041	0,0121	0,0069	0,0020
3 years	0,0054	0,0113	0,0078	0,0014
4 years	0,0042	0,0075	0,0063	0,0008
5 years	0,0053	0,0092	0,0073	0,0011
Total	0,0041	0,0121	0,0071	0,0015
JCI				
	Min	Max	Mean	Stdev
2 years	0,0056	0,0121	0,0083	0,0019
3 years	0,0054	0,0120	0,0083	0,0019
4 years	0,0057	0,0123	0,0083	0,0018
5 years	0,0057	0,0118	0,0083	0,0017
Total	0,0054	0,0123	0,0083	0,0018

Table 18 - PAIRED T-TEST (P-VALUE) BETWEEN OPTIMAL AND VALUE-WEIGHTED PORTFOLIOS

Kompas 100			
	MSR-JCI	MV-JCI	MSR-MV
2 year	0,0000	0,0000	0,0045
3 year	0,0000	0,0007	0,0000
4 year	0,0000	0,0021	0,0000
5 year	0,0005	0,0294	0,2492
Total	0,0000	0,0000	0,0000
LQ45			
	MSR-JCI	MV-JCI	MSR-MV
2 year	0,0000	0,0000	0,3547
3 year	0,0000	0,0065	0,0000
4 year	0,0000	0,0273	0,0000
5 year	0,0000	0,0003	0,3128
Total	0,0000	0,0000	0,0000
IDX30			
	MSR-JCI	MV-JCI	MSR-MV
2 year	0,0003	0,0070	0,7082
3 year	0,0000	0,2388	0,0000
4 year	0,0000	0,0000	0,7182
5 year	0,0045	0,0133	0,4116

In Table 15-17, the mean of expected returns from the JCI proxy is consistently above those from the MSR and MV portfolio proxies. The difference in the mean of expected returns between MSR and JCI, and between MV and JCI, is also significant according to the paired t-test results in Table 18 (the p-value of MSR-JCI and MV-JCI is far below the significance level of 10%). The results are consistent for each periodicity in Kompas 100, LQ45, and IDX30 components. On average, the standard deviations of expected returns in the JCI proxy are also higher. These findings indicate that the usage of a value-weighted market proxy, such as JCI, leads to an overestimation of expected returns. The CAPM estimation using the JCI proxy is also subject to a larger standard deviation, thereby decreasing its reliability to be used in practice.

IV. DISCUSSION

The common assumption in standard CAPM research states that the value-weighted market index is mean-variance efficient, therefore it can be safely used for the empirical test of CAPM. The findings of this research challenge that assumption. First, the efficient frontier diagrams in Figures 1-12 show that the value-weight indices are always positioned below the efficient frontier, consequently, they can never be efficient. Second, JCI as the value-weighted market index used as a market proxy in this research produces an overestimation of beta values, leading to a higher expected return in CAPM estimation. This result is confirmed by paired t-test in Table 18 which shows that the difference in the mean of expected returns between market beta and optimal beta in the CAPM test is significant, therefore the presence of bias that causes the overestimation is confirmed. Third, the MSE values are higher in the expected returns resulting from market beta compared to optimal beta, indicating that the use of value-weighted JCI for beta estimation leads to lower CAPM performance.

V. CONCLUSION

Findings from this research imply that the validity of the value-weighted market proxy used in standard CAPM tests must be questioned. The usage of JCI as a standard market proxy in CAPM tests in Indonesia can result in a worse performance of prediction. In practice, CAPM has been used to calculate the cost of capital in capital budgeting or evaluation of investment projects. Inaccurate estimation of the cost of capital can lead to the rejection of a profitable project, or worse, the acceptance of a losing project. These reasons state the importance of using the optimal portfolio as the market proxy in CAPM.

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Paper 43

The Impact of National Economic Recovery Program in Indonesia on the Property and Real Estate Sector's Firm Performance and Distress

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ICMEM

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Abstract - The COVID-19 Pandemic which started as a health issue affects the economy as the government tries to limit activities in multiple business sectors. One of the sectors that are severely affected by economic recession due to the COVID-19 Pandemic is the property and real estate, which experience a significant decline in profitability and a potential solvency issue. This sector needs to sustain itself as it has a multiplier effect on the economy. To deal with this situation, the Government of Indonesia has issued the National Economic Recovery Program (Pemulihan Ekonomi Nasional - PEN). This research aimed to examine the financial impact of the PEN program on the financial sustainability of the firm in the property and real estate sector, as measured in financial performance and financial distress. Financial performance is measured through ratio analysis, including liquidity, activity, solvency, and profitability ratios. Financial distress is measured using Altman Z-Score. The result shows that the PEN program has a significant effect on the net profit margin and Altman Z-Score.

Keywords – Financial Performance, Financial Distress, National Economic Recovery Program

I. INTRODUCTION

The COVID-19 virus that started in December 2019 in Wuhan, China had spread all over the world, causing multiple health problems and accumulating fears among people. While the COVID-19 pandemic is a health problem, the countermeasure policy that many governments take is about limiting activities in multiple sectors, including business activities, and therefore causing larger economic problems [1]. Such policy leads to logistical delays in business' supply chain, huge reductions in production and consumption activity, financial distress of multiple companies, increasing numbers of unemployment, and contributes to the remarkable decline in global economic growth [2] affecting 92.9% of countries in the world [3].

One of the sectors that were severely affected by the economic decline due to the covid-19 pandemic is the property and real estate [4] with declining profitability of more than -100% to -650% throughout the Q1-Q3 2020 [5]. Furthermore, a study found that 61% of the property and real estate companies have an interest coverage ratio below 1 during Q2 2020, indicating a solvency issue [6].

The Indonesian government has issued the National Economic Recovery (Pemulihan Ekonomi Nasional - PEN) Program since June 2020 to reduce the impact of the COVID-19 pandemic on the economy. The PEN program covers six categories, including health, social security, priority program, local government, MSMEs, and business incentives.

The property and real estate benefited most from the business incentive category, which includes fiscal incentives such as Income Taxes Article 21 borne by the government (Pajak Penghasilan 21 Ditanggung Pemerintah - PPh 21 DTP) Value Added Tax on Buying Property borne by the government (Pajak Pertambahan Nilai pembelian properti Ditanggung Pemerintah- PPN DTP Property) and the reduction of Income taxes fee for business entities.

The government allocates IDR 1.3 trillion in the housing incentive program for the lower to the middle-income group to drive the demand. Property, real estate, and constructions are also the third-largest sectors that benefit from the business incentive program, with a total of 24,832 eligible business entities[7]. While the sector only contributes 2.79% to the Indonesian GDP[8], it has a multiplier effect on the economy as it employs around 19 million people and positively affects other 170 industries toward economic recovery[9]. Therefore, it is important to ensure the financial sustainability of the firm within the property and real estate sector.

Financial sustainability is defined as "the ability of the industry or firms to earn profits sufficient to make it worthwhile to continue business in the long run" [10]. The firm needs to be financially sustained as it would affect the firm's business sustainability itself. Financial sustainability can be measured from the perspective of financial performance using financial ratio analysis [11] and from financial distress perspective using the bankruptcy-prediction model [12].

Previous studies show that Altman Z-Score has the highest accuracy in predicting bankruptcy in various industry, including property and real estate [13], telecommunication [14], manufacturing [15], and provide consistent result after being tested in multiple countries [16]. While financial ratios also have been used in several studies to conduct financial performance and have proven to generate credible data [11].

II. METHODOLOGY

A. Financial Performance Analysis

Financial performance is a measure of the company's ability to manage and control its resources [17]. It is a quantitative measure of company success in terms of revenues, costs, debt structure, assets used, and investment returns. Financial performance can be measured using financial ratio analysis, which consists of liquidity ratios, activity ratios, solvency ratios, and profitability ratios [11].

A financial ratio is a value obtained from comparing one item with another item in the financial statements with a relevant and significant relationship [18]. Financial ratio analysis can be described as a method of calculating and interpreting financial ratios to analyze and monitor a firm's performance [19].

This research will use the current ratio (CR) as a liquidity measure, total assets turnover ratio (TATO) as an activity measure, debt-to-equity ratio (DER) and interest coverage ratio (ICR) as a solvency measure, and net profit margin (NPM), return on assets (ROA), and return to equity (ROE) as a profitability measure.

B. Financial Distress Analysis

Financial distress is a term used that refers to a stage of decline in a financial condition that occurs before the event of liquidation or bankruptcy [20]. It is a condition in which a company cannot generate sufficient revenues or income, making it unable to meet or pay its financial obligations [21].

The severity of financial distress experienced by a company can be measured using the financial distress model. One of the prominent financial distress models that will be used in this research is the Altman Z-Score developed by Edward I. Altman (1968) [12]. It has been used in a wide variety of industries [16], including property and real estate which gives the highest accuracy among the Springate (1978) and Zmijewski (1984) models [13].

Altman Z-Score has 2 modified versions, the Z' model (1983) for private companies and the Z" model for non-manufacturing companies and emerging markets [22]. In this research, the author will use the Z" model as the property and real estate sector consists of non-manufacturing companies and the location of the research, Indonesia, is still considered an emerging market. The Z" model has an equation as follows:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (1)$$

Where:
 Z'' = Altman Z-Score

- X_1 = Working Capital / Total Assets
- X_2 = Retained Earnings / Total Assets
- X_3 = EBIT / Total Assets
- X_4 = Book Value of Equity / Book Value of Total Liabilities

If Z-Score is > 2.60 , it indicates that the company is safe from bankruptcy. If it scored between 1.10 and 2.60 the company is in the gray area. And if it scored < 1.10 the company is in severe financial distress and is predicted to be bankrupt in 2-5 years [22].

C. Event Study Timeline

An event study is a statistical method to assess the impact of an event on the value of a firm. It starts by selecting the event window, the period over which observed variables of the firms involved in this event will be examined, then determining the pre-event and post-event window [23].

2020				2021			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Post-Covid Impact		Pre-event		Event Window (2021 PEN Impact)		Post-event	
Inc. Realization (%)	22.89%	46.50%		23.98%	63.5%	94.60%	100%
Economic Growth	-3.49%	-2.19%		-0.71%	7.07%	3.51%	5.02%
Property Sector Growth	1.96%	1.25%		0.94%	2.82%	3.42%	3.95%

Fig. 1 Event study timeline

In this research, the author will use the PEN 2021 Program as an event of interest with the event window span from Q1-Q3 2021. It is chosen based on the business incentive realization of the PEN 2021 which is already 94.60% in Q3 2021. The estimation window is defined in Q4 2020, before the start of the PEN 2021, while the post-event is evaluated in Q4 2021 as the program ended.

D. Research Design

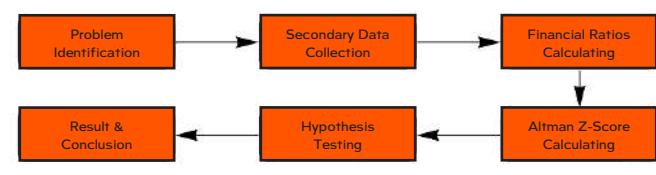


Fig. 2 Research Design

The research begins with identifying the problem of whether the PEN program brings significant changes to the financial sustainability of the firms in the property and real estate sectors. The author then collects secondary data from the Indonesia Stock Exchange (IDX) website. The author will calculate financial ratios and Altman Z-Score for the selected firms. After the calculation is finished, the author will do the hypothesis testing using a statistical test (paired t-test or Wilcoxon signed-rank test). The result will be discussed and summarized in conclusion.

E. Hypothesis Development

This research aimed to evaluate whether there are significant changes in the financial performance and/or financial distress of the property and real estate firms before and after the implementation of the PEN 2021 program. The hypotheses are as follows:

1. H1 : There is a significant difference in the current ratio before and after the program
2. H2 : There is a significant difference in the total assets turnover ratio before and after the program
3. H3 : There is a significant difference in the debt-to-equity before and after the program
4. H4 : There is a significant difference in the interest coverage ratio before and after the program
5. H5 : There is a significant difference in the net profit margin before and after the program
6. H6 : There is a significant difference in the return on asset before and after the program
7. H7 : There is a significant difference in the return on equity before and after the program
8. H8 : There is a significant difference in the Altman Z-Score before and after the program

III. RESULTS

A. Descriptive Statistics

This research uses 15 firms in the property and real estate sectors as samples.

Table 1 - DESCRIPTIVE STATISTICS

Before PEN 2021 Program					
	N	Mean	Min.	Max.	Std. Dev.
CR	15	2.3607	0.67	6.18	1.322
TATO	15	0.1660	0.02	0.39	0.087
DER	15	1.0013	0.11	3.15	0.775
ICR	15	17.0967	-10.11	109.28	37.922
NPM	15	-0.2356	-1.98	0.51	0.698
ROA	15	-0.0161	-0.38	0.20	0.128
ROE	15	-0.0336	-0.55	0.24	0.202
Z-Score	15	4.6113	1.32	13.01	3.090

Before PEN 2021 Program					
	N	Mean	Min.	Max.	Std. Dev.
CR	15	2.3607	0.67	6.18	1.322
TATO	15	0.1660	0.02	0.39	0.087
DER	15	1.0013	0.11	3.15	0.775
ICR	15	17.0967	-10.11	109.28	37.922
NPM	15	-0.2356	-1.98	0.51	0.698
ROA	15	-0.0161	-0.38	0.20	0.128
ROE	15	-0.0336	-0.55	0.24	0.202
Z-Score	15	4.6113	1.32	13.01	3.090

The descriptive statistics above show that there is an increase in the liquidity, as indicated by the mean value of CR which increase from 2.36 to 2.72. In the activity ratio, there is only a slight improvement in the mean value of TATO, from 16.60% to 16.93% in the period after PEN 2021 program.

For the solvency ratios, DER, the mean value slightly decreases from 1.0013 to 0.9900, while ICR shows an increase with the mean value of 17.10 to 29.18 in the period after the PEN 2021 program.

For the profitability ratios, NPM shows an increase in the mean value from -23.56% to 18.00% after the implementation of the PEN 2021 program. The ROA also shows an increase in the mean value from -1.61% to 2.85% in the period after PEN 2021. The ROE shows a similar pattern with the mean value increasing from -3.36% to 3.98% following the PEN 2021 program.

For the financial distress analysis, the property and real estate sectors are generally in the safe zone with the Altman Z-Score above 2.60 in both observed periods. The PEN 2021 program increases the Z-Score of the firms, with the mean value from 4.61 to 5.21, further reducing the possibility of financial distress within this sector.

Since the data sample ($n=15$) is lower than the minimum acceptable sample size to assume normality ($n=30$) the data cannot be assumed to be normally distributed. The statistical non-parametric test will be conducted to measure whether there is a significant difference in the variables.

B. Liquidity Ratios

The liquidity ratio reflects the firm's ability to pay its short-term (usually less than a year) liabilities as they come due. The author uses the current ratio to measure the liquidity of the firm.

As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the current ratio for the property and real estate firms before and after the implementation of the PEN 2021 program. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H₁

Table 2 - WILCOXON SIGNED RANK TEST – CURRENT RATIO

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 1	The median of differences between CR_Before and CR_After equals 0.	Wilcoxon Signed Rank Test	0.078

The pair of "CR before" and "CR after" has a significant value of 0.078, higher than $\alpha = 0.05$. Therefore, H₁ is rejected, meaning that there is no significant difference in the current ratio before and after the PEN 2021 program implementation.

C. Activity Ratios

Activity ratios are a financial measure of how efficiently a firm is utilizing its assets to generate revenues and cash. The author uses the total assets turnover ratio to measure the activity of the firm.

As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the total assets turnover ratio for the property and real estate firms before and after the implementation of the PEN 2021 program. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H₂

Table 3 - WILCOXON SIGNED RANK TEST – CURRENT RATIO

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 2	The median of differences between TATO_Before and TATO_After equals 0.	Wilcoxon Signed Rank Test	0.409

The pair of "TATO before" and "TATO after" has a significant value of 0.409, higher than $\alpha = 0.05$. Therefore, H₂ is rejected, meaning that there is no significant difference in the current ratio before and after the PEN 2021 program implementation.

D. Solvency Ratios

Solvency ratios refer to the firm's ability to meet its long-term obligations. The author uses both the debt-to-equity

and interest coverage ratio to measure the solvency ratio of the observed firms.

As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the debt-to-equity ratio for the property and real estate firms before and after the PEN 2021 program implementation. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H₃

Table 4 - WILCOXON SIGNED RANK TEST –DEBT-TO-EQUITY RATIO

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 3	The median of differences between DER_Before and DER_After equals 0.	Wilcoxon Signed Rank Test	0.414

The pair of "DER before" and "DER after" has a significant value of 0.414, higher than $\alpha = 0.05$. Therefore, H₃ is rejected, meaning that there is no significant difference in the debt-to-equity ratio before and after the PEN 2021 program implementation.

The next solvency ratio used is the interest coverage ratio. As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the interest coverage ratio for the property and real estate firms before and after the PEN 2021 program implementation. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H₄

Table 5 - WILCOXON SIGNED RANK TEST –DEBT-TO-EQUITY RATIO

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 4	The median of differences between ICR_Before and ICR_After equals 0.	Wilcoxon Signed Rank Test	0.691

The pair of ICR before and ICR after has a significant value of 0.691, higher than $\alpha = 0.05$. Therefore, H₄ is rejected, meaning that there is no significant difference in the interest coverage ratio before and after the PEN 2021 program implementation.

E. Profitability Ratios

Profitability ratios are financial metrics used to evaluate a firm's ability in generating profit relative to its revenue. The author uses the net profit margin, return on assets, and return on equity to assess the profitability of the observed firms.

As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the net profit margin for the property and real estate firms before and after the PEN 2021 program implementation. The author will use Wilcoxon signed-rank test to determine if there is a significant difference in both data and test the H_6

Table 6 - WILCOXON SIGNED RANK TEST – NET PROFIT MARGIN

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 5	The median of differences between NPM_Before and NPM_After equals 0.	Wilcoxon Signed Rank Test	0.038

The pair of "NPM before" and "NPM after" has a significant value of 0.038, lower than $a = 0.05$. Therefore, H_6 is accepted, meaning that there is a significant difference in the net profit margin before and after the PEN 2021 program implementation.

The next profitability ratio used is the return on assets (ROA). As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the return on assets for the property and real estate firms before and after PEN 2021 implementation. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H_6

Table 7 - WILCOXON SIGNED RANK TEST – RETURN ON ASSETS

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 6	The median of differences between ROA_Before and ROA_After equals 0.	Wilcoxon Signed Rank Test	0.106

The pair of "ROA before" and "ROA after" has a sig. value of 0.106, higher than $a = 0.05$. Therefore, H_6 is rejected, meaning that there is no significant difference in the return on assets before and after the PEN 2021 program implementation.

The next profitability ratio that the author use is the return on equity (ROE). As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the return on equity for the property and real estate firms before and after the PEN 2021 program. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H_7

Table 8 - WILCOXON SIGNED RANK TEST – NET PROFIT MARGIN

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 7	The median of differences between ROE_Before and ROE_After equals 0.	Wilcoxon Signed Rank Test	0.139

The pair of "ROE before" and "ROE after" has a significant value of 0.139, higher than $a = 0.05$. Therefore, H_7 is rejected, meaning that there is no significant difference in the return on equity before and after the PEN 2021 program implementation.

F. Altman Z-Score

Altman Z-Score (ALT) is a bankruptcy-prediction model that can be used to assess if a firm is financially distressed. The author will use Altman Z-Score to address the bankruptcy risk of the firm within the property and real estate sector and determine whether the PEN 2021 program brings significant changes to the observed firms.

As the data are not normally distributed, the statistical nonparametric test can be conducted to measure whether there is a significant difference in the Altman Z-Score for the property and real estate firms before and after the PEN 2021 program. The author will use Wilcoxon signed-rank test to determine if there is a significant median difference in both data and test the H_8

Table 9 - WILCOXON SIGNED RANK TEST – NET PROFIT MARGIN

Hypothesis Test Summary			
	Null Hypothesis	Test	Sig.
Pair 8	The median of differences between ALT_Before and ALT_After equals 0.	Wilcoxon Signed Rank Test	0.009

The pair of "ALT before" and "ALT after" has a significant value of 0.061, higher than $a = 0.05$. Therefore, H_8 is accepted, meaning that there is a significant difference in the Altman Z-Score before and after the PEN 2021 program implementation.

IV. DISCUSSION

A. The PEN 2021 Program

The PEN 2021 program affects property and real estate companies the most through its business incentive category. The PEN program aimed to recover the Indonesian economy by improving both the demand and supply side through various stimuli, incentives, and fiscal policy. Below are the policies that are considered to have some effect on the property and real estate sector.

1. PPN DTP Property: DTP stands for ditanggung pemerintah, meaning that the PPN (value added tax/VAT) from buying a property, which is usually borne by the customer, is now fully or partially borne by the government. It could reduce the price, improve the buying power of the customer, and have the potential to increase the demand and subsequently, sales and revenue. As of December 2021, the government has disbursed IDR 0.79 trillion (23.8% of the allocated budget) to 941 property sellers [7].
2. PPN DTP for Room Rent: During the PEN 2021 program, the 10% rent VAT is fully borne by the government. This program is given to the retail traders who sell the products or services to the end user. This program gives benefits to the property and real estate segments as some of the companies operate shopping centers, malls, hospitals, offices, and other types of buildings while generating revenue from the rent fee. The program is expected to give a demand boost which could translate into increased revenue for property and real estate firms. As of December 2021, the government has disbursed IDR 0.17 trillion (14.2% of the allocated budget) to 885 retail traders [7].
3. PPh 21 DTP: Tax article 21 on income taxes (Pajak Penghasilan – PPh 21) is an income tax that is paid by individual and business entities. During the PEN 2021 program, the government bore the income tax of the employees in the sectors that are heavily affected by the covid-19 pandemic, including property and real estate. This fiscal incentive is given by the government to increase the buying power of the affected employees by giving them a full salary (not deducted by income taxes). From the employer's perspective, the PPh 21 DTP could reduce the unemployment rate during the economic recession due to the covid-19 pandemic so that the firm's productivity remains stable. As of December 2021, the government has disbursed IDR 3.63 trillion (70.3% of the allocated budget) to 87,100 eligible taxpayers [7].
4. Installment reduction for PPh 25: Tax Article 25 on Income Taxes (Pajak Penghasilan – PPh 25) is an income tax that is paid in installments by a business entity with historical company data. When there is a decrease in business activity, such as the economic recession due to the COVID-19 Pandemic, the taxpayer can apply for a reduction in the installment of PPh 25. During the PEN 2021 program, the installment reduction is up to 50% for the selected sectors, including property and real estate. As of December 2021, the government has disbursed IDR 25.23 trillion or 123.1% of the allocated budget to 58,100 eligible taxpayers [7].
5. Tax rate reduction for the business entity: In 2020, the

tax rate for a business entity is 25% of taxable income and 20% for public firms. During the PEN 2021 program, the tax rate is reduced to 22%. The rate is 3% lower for the public firms that have a minimum of 40% of their stock traded on the Indonesia Stock Exchange, with a tax rate of 19% in 2020 and 17% in 2021 [24]. The tax rate reduction applies to all business entities in every sector. As of December 2021, the government has disbursed IDR 5.79 trillion, or 88.7% of the allocated budget [7].

The policies mentioned above could be divided into the demand-side and supply-side policies. The demand-side policies are the policy to increase the demand and subsequently, sales of the firms. These policies are PPN DTP Property, PPN DTP for Room Rent, and PPh 21 DTP. The supply-side policies are the policy to lower costs for the firms and subsequently, increase the supply to the market. These policies are Installment reduction for PPh 25 and the tax rate reduction for the business entity.

B. Financial Performance Analysis

The financial performance analysis is based on the result of the selected financial ratios that have been calculated, consisting of liquidity ratios, activity ratios, solvency ratios, and profitability ratios.

For the liquidity measure, most firms show an increase in liquidity as shown in the current ratio (CR) which increases from 2.36 to 2.72. This is mainly due to the decision to reduce the current liabilities of the firm while maintaining a similar amount of the current assets. This action is taken by many firms to reduce the risk of not being able to pay their short-term liabilities given that the economic growth is still negative at the end of 2020.

For the activity measure, there is a slight increase in activity as shown in the total assets turnover (TATO) which increases from 0.166 to 0.170. From the financial statements, most of the firms' total assets are relatively similar in both periods while some firms experience an increase in sales. The result shows that the PEN 2021 program from the demand side, affects the companies which most of its operations consist of landed houses, flats, malls, and shopping centers. In addition, potential users found that it is difficult to use the tax incentive due to the disorganized regulations at the local government level, while many others have not aware of these policies[25]. These findings could attribute to the insignificant changes in sales and hence in TATO.

For the solvency measure, this research uses both the debt-to-equity ratio and interest coverage ratio. Most firms do not take more debt, even lowering the debt as shown in the debt-to-equity ratio (DER) which decreases

slightly from 1.001 to 0.990. These actions are mainly the result of the rising uncertainty due to the declining economy at the end of 2020. In addition, the property and real estate sector is not receiving the debt restructuring policy in the PEN 2021 program and this may result in a more careful approach toward debt given the economic uncertainty.

From the ICR perspective, most firms show an ability to meet their interest payment obligation as the interest coverage ratio (ICR) scores above 1, and the average ICR score increases from 17.10 to 29.18. Based on the financial statements, most of the interest expenses are relatively similar in Q4 2020 and Q4 2021. The PEN 2021 program also does not have any policy which regulates the amount of interest payment or debt restructuring for the property and real estate sector, which further implies that the rise in ICR is mainly due to the business decisions taken by firms.

For the profitability measure, the author uses the net profit margin, return on assets, and return on equity. Based on the calculation, most firms experience profit after the program is implemented as shown in the average value of net profit margin (NPM) which increases from -23.57% to 18.00% and is found to be statistically significant. Looking at the financial statements, most of the firms' tax expenses are found to be lower in Q4 2021 as opposed to Q4 2020. This could be a result of the PEN 2021 program, as it has multiple fiscal policies that are eligible for the property and real estate sector, including installment reduction for PPh 25, and tax rate reduction for the business entity.

From the ROA perspective, most firms increase their profit-generating efficiency as shown by the average value of ROA that changes from -1.61% to 2.85% after the implementation of the PEN 2021 Program. The increase in ROA is a result of an increased net income due to several fiscal policies implemented by the government during the program, while the total assets for most firms are not changing much during the observed period.

From the ROE perspective, most firms increase their profit-generating efficiency as shown by the average value of ROE that changes from -3.36% to 3.98% after the implementation of the PEN 2021 Program. Using the Dupont analysis, the increase in ROE can be explained by the increase in the net profit margin as the other two components, the total assets turnover, and financial leverage does not change much during the observed period.

C. Financial Distress Analysis

Using Altman Z-Score, the property and real estate sector was in the "safe" category before the implementation of

the PEN 2021 Program, with a Z-Score of 4.61, higher than the safe limit of $Z\text{-score} > 2.60$. It indicates that even if the average profitability for the sector is negative in Q4 2020, the sector is still considered safe from bankruptcy.

After the implementation of the PEN 2021 program, the Altman Z-score rose significantly from 4.61 to 5.20. A higher Z-score means that the sector is considered safer from bankruptcy or has a negligible bankruptcy probability. Looking at each component of the equations, the mean value differs significantly for the X4 component. This can be caused by some reduction in the total liabilities or an increase in the retained earnings which further increase the total equity of the firm.

V. CONCLUSION

This research examines the impact of the PEN 2021 program on financial performance and distress within the property and real estate sector. Financial performance is measured by ratio analysis, consisting of liquidity (current ratio), activity (total assets turnover ratio), solvency (debt-to-equity and interest coverage ratio), and profitability (net profit margin, return on assets, return on equity) while the financial distress is measured by Altman Z-Score model.

Upon the completion of this study, one profitability ratio (net profit margin) and the Altman Z-Score were found to be increased significantly from the period before and after the implementation of the PEN 2021 program. The other profitability ratio (return on assets and return on equity) were also increasing but not significant. On the contrary, the liquidity, activity, and solvency ratio were not significantly different in both observed periods.

Based on the calculation result and discussions, the PEN 2021 program has a significant impact on the profitability and the Altman Z-Score of the observed firms. The increase in profitability and Altman Z-Score can be attributed to the supply-side policies of the PEN program, which is to reduce the tax burden of the business entities. Policies such as installment reduction on PPh 25 and tax rate reduction for business entities further lower the taxes paid by the firms and subsequently increase their profit. The financial distress level is also reduced since the firm now has excess money that can be allocated to its capital as retained earnings, making the firm could last longer during an unpleasant business situation. A study about fiscal policy during the global financial crisis in 2009 also report similar findings in which the firms' profitability increase significantly after the stimulus given [26].

On the other hand, the PEN 2021 program does not have a significant impact on the liquidity, activity, and solvency of the firms. While it is true that the program has

several policies to stimulate the demand, such as PPN DTP Property, PPN DTP for Room Rent, and PPh 21 DTP, the number of users is insufficient to drive the sales of the property[7] and real estate firms combined with the regulatory issue[25], resulted only in a slight increase in the activity ratio. A study about government fiscal policy also finds that the demand-side policies mentioned above do not have a significant impact to increase purchasing power or consumption [27].

As for the debt, it is much more likely to be affected by the economic circumstances and individual decisions of the firms to not increase the debt or even reduce it. The PEN 2021 program has a debt restructuring policy, but it is not received by property and real estate firms. As a result, most firms maintain a relatively stable debt position and do not make any drastic or significant changes, as indicated by the liquidity and solvency ratios. These decisions were taken mainly due to the increased uncertainty. A similar decision was also observed during the global financial crisis in 2009 [28].

During the PEN 2021 program, the property and real estate firms experience significant changes in profitability and reduced financial distress, showing that the supply-side policies are effectively implemented in this sector. On the contrary, the demand-side policies are not effectively implemented as showed by insignificant changes in the activity ratio and the small number of users that get benefit from these policies. As the PEN program does not have any policies regarding debts, the liquidity and solvency ratio remains unaffected.

Based on the findings in this research, the property and real estate sector with its multiplier effect could contribute to a faster economic recovery if properly managed. For the next 2022 PEN program, there are several recommendations for the government in making policies for the property and real estate sectors:

1. For the supply-side policies, such as installment reduction on PPh 25 and tax rate reduction for business entities, the government could reduce the budget allocation on these policies by normalizing the installment on PPh 25 and/or increasing the tax rate gradually to the normal rate since most firms have shown a positive net profit at the end of 2021.
2. For the demand-side policies, such as PPN DTP property, PPN DTP for Room Rent, and PPh 21 DTP, the government should focus on promoting the tax benefit to the wider prospective audiences while working on the regulatory issues in many local governments so that the demand could increase significantly and have a noticeable impact on the property and real estate firms.

3. For the policies regarding debt, the government does not have to be concerned since most firms will be able to pay for the short-term liabilities as it has enough current assets and the long-term liabilities as it has enough operating profit to pay for their interest expenses while the proportion of debts in most companies are on par with its equity for most firms.

In conclusion, there is sufficient evidence to support that the PEN program significantly affects the financial sustainability of the property and real estate sector by increasing its profitability and reducing its financial distress.

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Paper 44

Does CSR help reduce firm risk during a financial crisis :
Evidence from listed Indonesian corporations

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Abstract - A corporation's Corporate Social Responsibility provides insight into how it is being managed. Corporations with good CSR performance have shown that CSR can be used as a tool to enhance a corporation's image and reduce its firm risk. The Covid-19 pandemic provides a valuable exercise to help examine the relation between CSR and firm risk during a financial recession. This study aims to give a deeper insight towards how CSR and its parts affects firm risk through its usage of a CSR Index score, instead of using disclosure data. This paper examines a sample of 40 firms listed on the Indonesian Stock Exchange (IDX) from 2018 to 2021. This paper expects to find that CSR negatively affects a firm's total risk and systematic risk.

Keywords – CSR, Firm Risk, Risk Reduction, Indonesia, Covid-19, Recession

I. INTRODUCTION

The Coronavirus Disease 2019 (Covid-19) pandemic has brought upon unprecedented effects to Indonesia. Due to the respiratory virus being easily transmitted to other people, many governments implemented lockdown procedures to try and limit the spread of the disease. The Ministry of Health in Indonesia issued regulations that implemented a limit on public movement on the 8th of April 2020 by which time there had been 2,956 confirmed cases, all 34 provinces had cases, and Indonesia having the fourth worst Covid-19 testing rate of countries with populations over 50 million. While the limit of public movement was deemed necessary to maintain public health, it had an adverse effect on almost all industry sectors in Indonesia leading to an economic recession in Indonesia (Miharja et al., 2020).

The recession created an unstable environment for the companies that operated publicly in Indonesia. The Jakarta Composite Index experienced a high-low decline of 37.7% in the first three months of 2020 during the period before the pandemic started and when the first Covid-19 case was found in Indonesia and subsequently the first limit of public movement was instilled. With an unstable economy, companies struggle with increasing firm risk. Using stock return volatility as a proxy for total risk and CAPM beta as proxy for systematic risk.

The predominant thought has been that Corporate Social Responsibility (CSR) is a way to maximize shareholder

welfare through endeavors has been shown to have a positive impact on firm risk during a recession (Lins, Servaes, and Tamayo, 2017). During periods of severe instability, such as a recession, investors' behavior is influenced by CSR since CSR acts as a measure that instills trust in the company

As a period of recession, the Covid-19 pandemic is very much different from the recession that have come before it. This is due to the reason the recession was started. Rather than an economic situation the recession was started due to a public health issue, and it has caused a shock to international markets (Bernanke, 2020). Lending to the belief that this is an unprecedented opportunity to study the relationship between CSR and firm risk in Indonesia.

The literature that examines firm risk and CSR Indonesia currently is limited to research that utilizes Kinder, Lydenberg, and Domini's KLD Research Analytics database and CSR disclosure (Eriandani and Wijaya, 2021; Devie, Liman, Tarigan, and Jie, 2020). With rating data for Community, Employees, Environment, and Government dimensions provided by CSRHUB, this paper tries fill the void by examining the relations of each dimension of CSR to firm risk and if there are significant differences between each one to the other.

According to Minor and Morgan, (2011) The correct strategy for businesses to deal with the hazards they experience in a business climate that is becoming increasingly dynamic is to have precautions. CSR efforts are a kind of corporate self-defense. The incorporation of corporate social responsibility and management of risk should not be avoided due to the immediate costs the firm faces but to enhance the brand in the long-term. Due to this, firm that approach not only the economic factor but also approach environmentalist and ethical factors can develop a more robust brand, more options to innovate and reduce firm risk (Godfrey, 2005b; Luo and Bhattacharya, 2009). When companies with excellent social performances meet economic volatility, they are less likely to be affected due to their strong social presence attracting support from more stakeholders than a company with poor social presence. According to Albuquerque et al. (2019), a company's profit circumstances will be less affected by aggregate economic conditions if it has loyal customers. Existing research also demonstrates that CSR can influence employee attitudes and behavior by

fostering organizational pride. CSR influences, for example, employee attachment to and pride in their organization, and consequently their work-related attitudes and behaviors. By fostering a positive work environment and developing internal CSR policies, businesses may increase employee productivity and happiness. Dedication to CSR positively affects employee morale and commitment (Flammer and Kacperczyk, 2016). The support and confidence of these stakeholders generates sustainability and reduces the company's future risk. Investors believe that companies with poor CSR are riskier investments (Spicer, 1978) and CSR can lower stock volatility when something negative occurs (Becchetti et al., 2015). Good CSR performance can reduce information asymmetry, serve as an indicator of creditworthiness, and reduce the risk of default in debt transactions. The literature discussing the effect CSR has on firm risk and financial performance during the pandemic also have shown that CSR affects firm risk negatively (Albuquerque et al., 2020; Huang and Ye, 2021; Ding et al. 2020).

The previous literature review on CSR effect on firm risk led to the following hypotheses:

H1: CSR reduces firm risk faced during the COVID-19 pandemic.

II. METHODOLOGY

A. Sample Selection

The data we decided to include covers the span of 2018 to 2021 which is two years before the pandemic started and two years that are attributed as Covid-19 years. To source the CSR data, we utilized CSRHub. For the period of 2018-2021, CSRHub had 48 Indonesian companies that were available. From the 48, 8 financial companies were removed due to the difference in characteristics, as per Huang and Ye (2020). From the 40 firms we collected stock return data from January 2016 to December 2021 and accounting records from 2018 to 2021 both sourced from Yahoo Finance. The data from January 2016 accounts for the rolling window firm risk. Table 1 will present the definition of the variables and Table 2 will be showing the summary statistics, which will include the average, standard deviation, lowest value, median, and highest, on all the variables that are used in the paper.

B. CSR

During the research, we have elected to utilize CSR data ratings that we acquired from the ESG services provider CSRHub. We acquired data over the period from 2018 to 2021 to examine the effect CSR has firm risk in Indonesian corporations before and during the pandemic. The reasons are as follows. There have not been any studies on the

effects of CSR on firm risk that utilize rating data, instead using CSR disclosure and KLD (Eriandani and Wijaya, 2021; Devie, Liman, Tarigan, and Jie, 2020). According to CSRHub, it generates ratings with data sourced from a multitude of publications, socially accountable investing firms, ESG indexes, and government agencies to provide CSR ratings of more than 5000 companies from 65 countries. Some sources provide numerical scores while others use relative rankings or signs ("+" or "-"). CSRHub takes in all the data sources then screens, aggregates, and normalizes the data from these sources. CSRHub then outputs a data format that provides a single value ranging from 0 to 100 for each category/subcategory, which allows for easier interpretation based on the relationships found in the analysis.

Past studies that have utilized the KLD database as a reference for CSR sustainability ratings have included these six dimensions: corporate governance, employee community engagement, diversity, relations, the environment, and the product. KLD employs numerous criteria to analyze businesses, including positive and negative screens that indicate firm strength and weakness, respectively. Each screen is a binary variable with values of 1 and 0. Studies that utilize CSR disclosure also rely on a binary variable but is even less specific as the contents of the reports and potential wrongdoings are not considered.

C. Firm Risk

We utilized total risk and systematic risk as proxies for firm risk. Total risk measures a company's aggregate susceptibility to COVID-19 risk. Systematic risk evaluates the market risk. Since the COVID-19 epidemic affected global financial markets, we investigate the influence of CSR on several types of corporate risk. Following Jo and Na, (2012). Initially, we measure the firms' total risk (Stock volatility) as the standard deviation of rolling monthly stock returns over the last 36 months. To depict the shock effect COVID-19 had on the global markets, we adopt 36-month rolling windows as opposed to 60-month rolling windows. A longer rolling window can lessen COVID-19's impact on the sample. Using a 36-month rolling windows we use the capital asset pricing model (CAPM) (Sharpe, 1964) to serve as proxy for the systematic risk (Beta) where the excess return on the stock uses Jakarta Composite Index as the proxy for the market, with data collected from Yahoo Finance.

D. Control Variables

Following Albuquerque et al. (2020) Ding et al. (2020),

Huang and Ye (2021) and Jo and Na (2012) we include firm-level controls such as firm size (Size), market-to-book

ratio (Market to Book), profitability (ROA), and financial leverage (Leverage).

E. Model Construction

We constructed the following regression model:

$$Risk_{it} = \beta_0 + \beta_1 * COVID * CSR_{it-1} + \beta_2 * COVID + \beta_3 * CSR_{it-1} + \beta_4 * Size_{it-1} + \beta_5 * ROA_{it-1} + \beta_6 * Leverage_{it-1} + \beta_7 * Market\ to\ Book_{it-1} + Firm\ fixed\ effects + Industry\ fixed\ effects + \epsilon_{it}$$

where $Risk_{it}$ includes the stock volatility and systematic risk, CSR_{it-1} includes the scores of the four CSR dimensions, $Size_{it-1}$ is the natural logarithm of the total assets, ROA_{it-1} is the net income divided by total assets, $Leverage_{it-1}$ is the total debt divided by total assets, $Market\ to\ Book_{it-1}$ is the market cap divided by the book value of equity, and ϵ_{it} is the error term for firm i in year t .

Table 1 - VARIABLE DEFINITIONS

No.	Variables	Definition	Source
Panel 1: Dependent Variables			
1	Total risk	Uses the standard deviation of a rolling monthly stock return sample over the past 36 month to serve as proxy for total risk	Yahoo Finance
2	Systematic risk	Uses the CAPM Beta estimations of a rolling monthly stock return sample over the past 36 month to serve as proxy for systematic risk.	Yahoo Finance
Panel 2: Firm-level variables			
3	COVID	Dummy variable that is used to signify the pandemic happening. Equals zero from 2018 to 2019 and equals 1 from 2020 to 2021.	CSRHUB
4	Overall	CSRHUB's overall CSR rating.	CSRHUB
5	Community	CSRHUB's Community category rating which covers the company's commitment to human rights, supply chain, product quality and safety, product sustainability, community development, philanthropy.	CSRHUB
6	Employees	CSRHUB's employee category rating which covers commitment to diversity, labor rights, compensation, benefits, training, health, and worker safety	CSRHUB
7	Environment	CSRHUB's Environment category rating which covers commitments to environmental policy, environmental reporting, waste management, resource management, energy use, climate change policies, and performance.	CSRHUB
8	Governance	to leadership ethics, board composition, executive compensation, transparency, and reporting, stakeholder treatment	CSRHUB

9	Size	Uses the natural logarithm of the company's total assets.	Yahoo Finance
10	ROA	Uses the net income which is divided by total assets.	Yahoo Finance
11	Market to Book	Uses the Market Cap (outstanding stocks minus treasury stock multiplied by stock price), divided by the Book value of equity.	Yahoo Finance
12	Leverage	Uses the total debt divided by the total assets	Yahoo Finance

Table 2 - SUMMARY STATISTICS

Variables	N	MEAN	STDEV	MIN	MEDIA N	MAX
STOCK VOLATILITY	160	0.121054	0.04890	0.05431	0.11510	0.42340
TIC RISK	432	893	7805	3573	0525	
OVERALL	160	1.522636	0.69525	0.11829	1.46848	3.54054
SOCIAL	114	7591	7044	9325	3044	
ENVIRONMENT	160	51.15984	6.33853	36	51	70
SIZE	844	9976				
GOVERNANCE	160	52.40520	8.01473	28	51.5	75
ES	625	6097				
MARKET TO BOOK	160	53.12948	6.66698	38	53.5	69
LEVERAGE	75	0577				
ENVIRONMENT	160	52.21531	8.48008	30	51	72
GOVERNANCE	25	1435				
ES	160	46.98313	7.16056	27	47	68
SIZE	75	8112				
ROA	160	52.6724	6.62543	36.5	52	70.5
ES	815	0917				
MARKET TO BOOK	160	31.33120	0.89758	29.2064	31.1786	33.5372
LEVERAGE	815	0757				
ENVIRONMENT	160	0.067912	0.08631	-	0.04869	0.46660
GOVERNANCE	674	8519				
ES	160	0.17142	0.16774	9807	1.26273	53.3366
SIZE	6159	7245				
ROA	160	3.014503	7.21737	0.16774	645	0176
MARKET TO BOOK	54	7324				
LEVERAGE	160	0.256140	0.18320	0	0.24488	0.78523
ENVIRONMENT	888	3423			4381	4274

III. EXPECTED FINDINGS

This paper has an expected output of the following. First, firms that perform well in CSR will have a smaller change in their stock volatility and their systematic risk when the Covid-19 pandemic arrives than firms that have worse performance in CSR as CSR has been proven to protect firms from risk during periods of economic recession by Lins, Servaes, and Tamayo (2017). We expect to find that the CSR dimensions will not have the same weight in affecting the firm risk in the pandemic. As Albuquerque, et al (2020) has found the CSR dimensions of environment and community have a closer tie to public health and will be a crucial indicator of CSR strength during a crisis of public health like Covid-19. We expect that firms with low leverage ratio will have a lower effect of CSR to firm risk during the pandemic as it has been proven by Huang and Ye (2021) that firms with lower leverage ratio will be protected from firm risk regardless of CSR performance. The managerial implications that this paper hopes to affect will be the changing of perception of CSR no longer

seen as a cost that is wasted to fulfill regulations but as a possible safety net for companies for the future, with added focus for companies that are operating with higher leverage ratios as they are more in risk during periods of recession. This paper hopes to contribute towards the existing literature on corporate social responsibility and corporate risk management.

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Paper 45

Economic Asset Optimization To Enhance Profitability Of
“XSW” Oil Field Offshore Block

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ICMEM

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Abstract - Indonesian oil and gas production decreased in the last decade. Majority current oilfield producer backbone located onshore was mature field category and going to depletion phase. Meanwhile, exploration activities have not found new significant economic oil and gas reserves, then one of the efforts that can be done is to asset optimization the existing oil reserves that still have economic value. To overcome this condition, there have been shifting paradigms by the upstream company to change focus in oil and gas development field from onshore to offshore oilfield.

XSW offshore block already produced oil 41.39 MMSTB and had 7.9 MMSTB remaining reserves. The project's purpose is to create XSW development scenario to enhance its profitability with Environmental Social Governance (ESG) principle, and evaluate project economics through Production Sharing Contract (PSC) cost recovery scheme. The scenario applied sensitivity analysis of oil price, oil production cumulative, operational and capital expenditure. The best scenario can generate 7.3 MMSTB incremental oil production, total investment 81.31 million USD, gross revenue 495.52 million USD, company's profit 57.73 million USD, government profit 86.6 million USD. As the capital budgeting perspective, the project can generate NPV 18.58 million USD, IRR 20.77%, payback period 5.42 years.

Keywords - asset optimization, economic value, offshore oilfield, Environmental Social Governance (ESG), Production Sharing Contract (PSC)

I. INTRODUCTION

PEP is one of the leading national oil and gas companies in Indonesia. PEP is one of the subsidiary state-owned enterprises that run in the energy sector, established in 2005 will be focused on operator oil and gas activity as mandated in Law Number (No) 22 of 2001 subject to oil and gas.

In running the upstream oil and gas industry, PEP partners with government representatives through a Production Sharing Contract (PSC) contract agreement with a cost recovery scheme that will terminated in the end of 2035.

The oil and gas industry in general have five stages of activity consist of exploration, production/development, processing, transportation, and marketing. These five main

activities can be divided into two categories, classified as upstream and downstream activities. Upstream oil and gas business activities are exploration and production activities, while downstream business activities are processing, transportation, and marketing.

A. Upstream Oil and Gas Industries

Exploration which includes geological studies, geophysical studies, seismic surveys, and exploration drilling is the initial stage of all upstream oil and gas business activities. This activity aims to find new reserves. If economical reserves are found to be developed, then it will continue with production/development activities.

Production activities include drilling for an additional number of wells and spacing with the purpose of optimizing the drainage radius of oil and gas reserves in the reservoir. This production activity also has three stages primary, secondary, and tertiary. The crude oil that is successfully produced will be sold to the refinery unit and finally become revenue for the company.

Exploration and production involved a series of long-term processes not only operational activities but also investments as well.

B. Production Sharing Contract (PSC) Scheme

The Government of Indonesia (GOI) applied specific regulations for managing the oil and gas industry, named Production Sharing Contract (PSC) through a cost recovery scheme. PSC scheme was introduced in Indonesia in 1966 but officially enforced in Indonesia in 1971 through Law Number (No) 8 of 1971 subject to Oil and Gas Mining Company, which rules that state-owned companies can cooperate with other parties in managing and operating upstream oil and gas activities in the form of production sharing contract.

The cost incurred by the oil and gas contractor will receive recovery costs. The return on investment costs is only given after producing oil and or gas by scenario installments from a portion of oil and gas production. The PSC contractor will receive their share in the form of a volume of oil or gas.

In the PSC system, an oil and gas company appointed by the government as a contractor manages a certain working area. The company ensures all the risks and costs

of exploration, development, and production. Exploration has succeeded in finding commercial oil and gas reserves, contractors are given the opportunity to obtain costs (cost recovery) from production. The contractor gets a production share after deducting cost recovery which is called profit share or known as profit oil. The contractor is also obliged to pay income tax, and all equipment and installations become state property [1].

The proportion share that applied in the PSC scheme between PEP and Government is 67% for PEP take and 33% for the government take.

C. Business Issue Elaboration

The need to supply oil and gas in Indonesia grows rapidly year to year. It makes the Indonesian government should try to overlook how to improve oil and gas production significantly to balance the domestic demand.

Indonesian crude oil lifting performance in 2021 published by the Ministry of Energy Mineral Resources showed that for oil realization 660 Million Barrel Oil Per Day/MBOPD (93.65% of the target) and 981.98 MBOEPD (97.51% of the target) for natural gas [2].

The majority of current oilfield production is almost supported by the onshore field that already has high water cut. Meanwhile, the offshore field that has oil and gas reserves has not yet to be optimized its production due to several factors such as legal permits, deep-sea geographically, and offshore technology that already in Indonesia still not sufficient to cover the needs of the offshore contractor.

PEP currently operated 1 offshore block namely XSW Block. XSW block was first discovered by an exploration well in 1972 by an American company. Then it started to production/development stage in 1975. The company aggressively drilled development well in a total of 34 wells with 4 platforms, the last development drilling well was in 1992, until in 2000 the American company relinquished this block and finally operated by PEP. From 2000 until now, there are no new development activities in the XSW block, which caused the production rate of the XSW block drops significantly from around 3000 BOPD in 1999 before relinquishment, nowadays just around 750 BOPD.

Based on the Reserves and Resources Annual Report of XSW Block, there are some potential reserves of oil around 7.9 MMSTB that can be exploited from several kinds of development activities, for example, new infill drilling and workover.

The objectives of this research are to analyze the factor that can influence upstream oil and gas industries,

evaluate the XSW block, and whether it can optimize its development field and economic project.

II. METHODOLOGY

A. Conceptual Framework

To have a better understanding while explaining the business issue identification and the alternative recommendation that can be made from this research, the author tried to make a systematical conceptual framework in order for the analysis to be focused and narrowed to the objectives.

The oil and gas industry are involved a complex multi-discipline background and cross-function coordination between institutions, so, environmental analysis needs to be done in order to have a specific understanding each of sector that can be affected by its business process.

Environmental analysis is divided into two factors:

1. External Analysis: this part of the analysis tried to identify several factors that can be outside caused of the company and or outside of the current business sector. Commonly this will explain PESTEL analysis, and Porter's Five Forces to identify the current potential competitor in the same sector.
2. Internal Analysis: this part of the analysis tried to identify several factors that influenced from the inside of the organization's perspective on running the proper business strategy. This part will evaluate using SWOT analysis, meanwhile technical and economic analysis will be completed to define the output of the research.

B. Research Methodology

The research methodology that will be applied in this research uses a capital budgeting analysis framework. The objectives of this research are to evaluate the economic feasibility of project development in the XSW offshore oilfield. Several economic indicators will be evaluated such as Net Present Value (NPV), Internal Rate of Return (IRR) Net Cash Flow (NCF) and Payback Period.

This economic indicator will be calculated by the Indonesian PSC Cost Recovery scheme formula with some assumption parameters and technical input adjustment.

To ensure the risk factors of the economic project, sensitivity analysis ran for several parameters that can affect the entire project's economy.

C. Capital Budgeting

Capital budgeting is the process a business undertakes to evaluate potential major projects or investments [3]. The advantages of the capital budgeting method such as budget planning for the project's costs, estimating a timeline for its return on investment, and deciding whether the project's potential value is worth its capital investment. Some parameters that will be analyzed in the capital budgeting method are Net Present Value (NPV) Internal Rate of Return (IRR) and Payback Period.

Net Present Value (NPV): The NPV of a project is the sum of the present values of each of the cash flow, positive as well as negative, that occurs over the life of the project (Damodaran, 2014) [4]. The formula is as follows:

$$\text{NPV of a project} = \sum_{t=1}^N \frac{CF_t}{(1+r)^t} - \text{Initial investment} \quad (1)$$

Where CF_t = Cash flow in period t

R = Discount rate

N = Life of the project

The decision rule referred to NPV for the independent project:

If the $NPV > 0$, then, Accept the project

If the $NPV < 0$, then, Reject the project

Internal Rate of Return (IRR): The internal rate of return (IRR) is a metric used in financial analysis to estimate the profitability of potential investments. IRR is a discount rate that makes the net present value (NPV) of all cash flows equal to zero in a discounted cash flow analysis (Fernando, 2022) [5]. The formula is as follow:

$$0 = \text{NPV} = \sum_{t=1}^T \frac{C_t}{(1+IRR)^t} - C_0 \quad (2)$$

Where C_t = Net cash inflow during the period t

C_0 = Total investment costs

IRR = The internal rate of return

t = The number of time periods

- o When the value of the IRR project is greater than the hurdle rate, so the project is profitable and worth to be executed.
- o When the value of the IRR project is smaller than the hurdle rate, so the project tends to make a loss than reject the project.

Payback Period (PP): The payback period method is the amount of time required for a company to recover its initial investment in a project, as calculated from cash inflow.

III. RESULTS

A. External Environment Analysis

The sustainability of the oil and gas industry is not only determined by domestic policies but is also influenced by global issues. Therefore, the author tries to do an analysis using PESTEL analysis as follows:

Politic

: Uptrend and downtrend of oil prices very dependent on the stability of geopolitics conditions in the world. The last example is a confrontational war between Russia and Ukraine, and it can boost oil prices from an average of US\$ 60/barrel into becoming above US\$ 100/barrel. From a domestic perspective is an inconsistency regulation about the PSC scheme between cost recovery and gross split.

Economy

: Oil and gas in Indonesia still as the highest supporting revenue to the whole state revenue behind tax around 97.98 trillion Rupiah. It comes to sense because the majority of people's activities and industries still rely on oil and gas product.

Socio-Cultura

: The main objective of implementing upstream oil and gas activities is for the prosperity of the people, so the existence of upstream oil and gas activities can provide a socio-cultural multiplier effect directly to the Indonesian people. One of the efforts to empower domestic products is through Domestic Component Level (DCL) rules.

DCL is the minimum amount of the domestic component in goods, services, and a combination of goods and services. The government regulations require oil and gas contractors to limit the use of imported parts by a certain percentage with the aim of:

- o Increase the competitiveness and production of domestic goods
- o Increase job opportunities for Indonesian workers

Technology

: Technology applications in the oil and gas business always show an improvement to maximize the opportunity to produce remaining reserves of oil and gas. For example: horizontal drilling, floating offshore rig and production platform.

Environmental: The initiation of the Net Zero Emission (NZE) 2050 campaign in the Paris Agreement has also changed the paradigm of all companies worldwide to start oriented towards sustainable resource continuation. The Indonesian government has instructed all companies to implement Environmental Social Government (ESG) aspects.

Legal

: One of the biggest challenges in the oil and gas business in Indonesia is a legal permit. The government representatives created the One Door Service Policy (ODSP) to facilitate between the company and the related ministerial to issue the permit.

Porter's Five Forces Analysis:

Rivalry Among Existing Firms (Low to Medium) considering that each PSC company already has its respective working area limits according to the contract, the company only needs to make an effort to optimize the way of producing oil and gas from its area because each working area has different reservoir characteristics and volume of reserves.

Threat of New Entrants (Low), since the oil and gas industry are a capital-intensive sector, there are only several companies that can fulfill the requirements of the government. Several technical strict requirements, budget, and definite working program commitments for the first five years must be met by the prospective company.

Threat of Substitutes (Low to Medium) since the start of the transition energy campaign toward Net Zero Emission (NZE) in 2050, the demand for alternative energy has increased, but this still needs a long time to be realized due to infrastructure that has not been integrated from producers and distributors to the end-user of consumers.

Bargaining Power of Buyers (High) demand for crude oil products and their derivatives end product is still very high, so when demand increases, the market (buyer) is already involved in influencing oil price fluctuation.

Bargaining Power of Suppliers (High) as the main commodity, there are several countries that have large production and act as suppliers of net oil and gas exporters. These countries are members of the Organization Petroleum Exporting Country (OPEC) OPEC countries can affect the supply of world oil production by limiting or issuing production quotas and production reserves at any time if needed.

B. Internal Environment Analysis

To identify the current company's business condition and look for improvement to make new strategic planning or optimization in business process, SWOT analysis are run related to this topic research about XSW offshore development as follows:

Strength, PEP as the subsidiary of state-owned company, run the PSC contract through the cost recovery scheme, with share proportion Government Share 37% and Contractor Share 63%.

Weakness, XSW offshore block already produced since 1975, reservoir production decline naturally 20% per annum, located offshore, huge cost of OPEX and CAPEX.

Opportunities, the oil remaining reserves of the XSW block based on the 2021 reserves report still have a huge number of around 7.9 MMSTB proven reserves, the Indonesian demand for the end product of oil and gas tends to increase, especially in the term of post-pandemic Cov-19.

Threat, the old production facilities, legal permit for offshore area development, oil price fluctuation to the downtrend slope.

C. Technical Analysis

Technical analysis of the XSW block included the petroleum system, geological evaluation, reserves estimation, and potential forecast production from several development activities. XSW block currently produced oil rate on fluctuation around 500-700 BOPD.

The development plan of the XSW block is divided into two scenarios. Scenario 1 includes efforts to improve and replace some part of production facilities and reactivates the suspended well in order for the XSW block can produce oil at its optimum production rate around 1200-1500 BOPD. At the end of PSC contract in 2035, scenario 1 will produce oil cumulative at 2.1 MMSTB.

Scenario 2 basically is Scenario 1 added with four new drillings well and five workover activities. Two new drilling targeted 450 BOPD, and the remaining two wells targeted 325 BOPD, while each workover activity targeted 250 BOPD. At the end of PSC contract in 2035, scenario 2 will produce oil cumulative at 7.3 MMSTB.

D. Economic Analysis

The calculation referred to the PSC Cost Recovery scheme, with the assumption that oil price 2022 used 63 USD/barrel and for the future price refers to corporate policy, hurdle rate used 10.43%.

Scenario 1 will generate gross revenue of 141.98 million USD, the company's take 12.92 million USD, government take 19.45 million USD. From the capital budgeting perspective for the company, the company's Net Present Value (NPV) is 1.2 million USD, with an Internal Rate of Return (IRR) of 11.93% compared to company's hurdle rate reference of 10.43%; the project scenario still viable and profitable for the company. The payback period (PP) is 5.55 years which is the project will start to generate profit in the middle of 2027.

Scenario 2 will generate gross revenue of 495.52 million USD, the company's take 57.73 million USD, government take 86.6 million USD. From the capital budgeting perspective, the company's Net Present Value (NPV) is 18.58 million USD, with an Internal Rate of Return (IRR) of 20.77% compared to company's hurdle rate reference of 10.43%, the payback period (PP) is 5.42 years which is the project will start to generate profit in the end of 2026.

Table 1 - SCENARIO ECONOMIC PROJECT COMPARISON

Parameters	Scenario 1	Scenario 2
Gross Revenue (MM US\$)	141.98	495.52
Contractor Take (MM US\$)	12.92	57.73
Government Take (MM US\$)	19.45	86.6
NPV (MM US\$)	1.2	18.58
IRR (%)	11.93	20.77
Payback Period (Years)	5.55	5.42

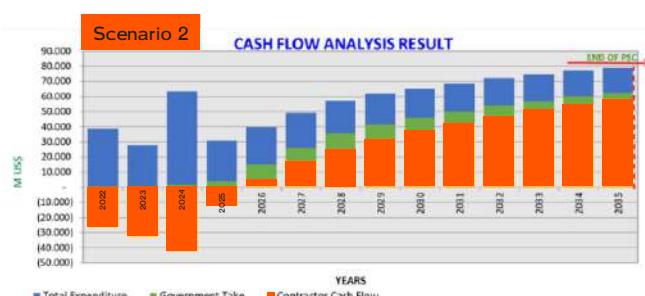
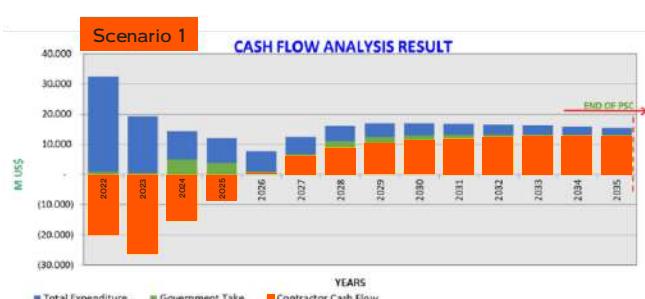


Fig. 1 Cash flow analysis comparison between two scenarios.

E. Sensitivity Analysis

The oil and gas industry business is dominated by several external uncertainty factors that a company or even a country can't even control. The sensitivity analysis runs to identify what factors affect the economy of oil and gas projects, especially in the XSW block project.

In this case, the factor tested is the oil price, OPEX, CAPEX, and oil cumulative production. The sensitivity will range +/- 20% from its initial number. The output of the sensitivity analysis is to review the effect on NPV project.

Table 2 - SENSITIVITY ANALYSIS SCENARIO 1

CAPEX		OPEX		Oil Production		Oil Price	
Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)
-20%	5,31	-20%	4,81	-20%	-4.28	-20%	-7.41
-10%	3.32	-10%	3,03	-10%	-1.48	-10%	-2.84
0%	1.22	0%	1,22	0%	1.22	0%	1.22
+10%	-0.88	+10%	-0.57	+10%	3.91	+10%	5.18
+20%	-3.01	+20%	-2.38	+20%	6.51	+20%	9.04

Table 3 - SENSITIVITY ANALYSIS SCENARIO 2

CAPEX		OPEX		Oil Production		Oil Price	
Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)	Δ chan ge	NPV (MM US\$)
-20%	26.14	-20%	30.38	-20%	1.69	-20%	-8.12
-10%	22.36	-10%	24.48	-10%	10.33	-10%	6.01
0%	18.58	0%	18.58	0%	18.58	0%	18.58
+10%	14.67	+10%	12.55	+10%	26.58	+10%	30.69
+20%	10.63	+20%	6.37	+20%	34.58	+20%	42.79

According to the sensitivity analysis project each of scenario, the factors that has highly influenced is oil price and oil production cumulative.

IV. DISCUSSION

PEP is operating XSW offshore block applied Economic Social Government (ESG) approach. PEP not only focused on its production target but also focused on the environmental conservation where its oilfield stands.

XSW offshore block is still attractive to be developed in the near future with several additional activities to improve oil production cumulatively. XSW block development Scenario 1 still generate profit for the company, but it has risk factor due to oil price fluctuation that will impact to NPV project to become negative. Scenario 2 development is the best scenario development that will generate profit higher for the company and give a higher share to the government.

Based on the economic project analysis, Scenario 2 is the best development scenario that is still viable to execute in XSW offshore block. Since the offshore material and rent facility costs are relatively higher than at the onshore activities, the author suggested that PEP can initiate the farm-in contract utilizing a method that can be used together with other PEP block oilfields but in different management zone (the same offshore oil and gas field), therefore the cost/price with service company provider can be negotiated lower than the individual project.

V. CONCLUSION

The evaluation of the XSW offshore block included external and internal environment factors of the oil and gas industry. External factors such as the stability of global geopolitics aspect play an essential role because once there is an issue about geopolitics, the impact directly on the oil price, that is one of the most sensitive factors for economic project calculation.

The government policy regarding oil and gas regulation also runs a critical factor, especially for investor attractiveness.

Indonesia's oil and gas production currently dominated by the onshore field, which is now in the depletion stage. Meanwhile, there are many oil and gas fields located offshore that have not yet developed optimally. XSW's offshore block development plan is divided into two scenarios.

According to the economic calculation and analysis using the PSC cost recovery scheme, scenario 1 generated 141.19 million USD gross revenue, 19.45 million USD government take, 12.92 million USD contractor take, with NPV 1.22 million USD, and 11.96% IRR on hurdle rate at 10.43%, payback period 5.55 years.

Scenario 2 generates 495.52 million USD gross revenue, 86.6 million USD government take, 57.73 million USD contractor take, with NPV 18.58 million USD, and 20.77% IRR on hurdle rate at 10.43%, payback period 5.42 years.

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Paper 46

Analysis Of The Relationship Between Financial Literacy And Financial Behavior Toward Financial Distress In Generation Y And Z During Covid-19 Pandemic (Case Study Bandung)

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Abstract - The world's economic contraction in recent years is unavoidable, given the increasing number of deaths caused by Covid-19 infection. Economically, Indonesian people are unprepared to deal with the country's economic paralysis. People of all income levels, from the poorest to the richest, are seeing income declines, implying that many previously financially secure people have become poor or were on the verge of becoming poor. As the result, the number of Indonesians making loans is growing. However, this rapid disbursement was followed by a drop-in borrowers' compliance to pay installments. In this research, multiple linear regression was used to analyze the relationship between financial literacy and financial behavior toward financial distress in generations Y and Z. The result was financial literacy and financial behavior have a positive and moderate relationship toward financial distress. Furthermore, generations Y and Z in Bandung have a moderate level of financial literacy, and during the Covid-19 Pandemic, based on the InCharge Financial Distress/Financial Well-Being scale (IFDFW), generations Y and Z in Bandung experienced moderate financial distress.

Keywords - financial literacy, financial behavior, financial distress, IFDFW

I. INTRODUCTION

A. Background and Context

One of the things that have recently become a big concern for the whole world is the Covid-19 pandemic because of the many problems and negative impacts that continue to occur. Several international institutions, including the International Monetary Fund (IMF) and the Organization for Economic Cooperation and Development (OECD) forecast a 4.4 percent and 4.2 percent decline in global economic growth in 2020, respectively [1]. The results of the Consumer Financial Literacy Survey conducted by the National Foundation for Credit Counselling (NFCC) in collaboration with the Harris Poll 2020 show that there is a decline in income and unexpected financial conditions, resulting in 58 percent of households experiencing difficulties in paying debts [2]. This will be exacerbated by data from the International Labor Organization (ILO) which predicts that the global unemployed will reach 205 million by 2022. Reflecting on what occurred during the covid-19 pandemic, so many people suffered financial distress. Disruptions in economic activity that result in a decrease

in income or even a sudden loss of income, as well as unexpected increases in expenses, when combined with poorly planned financial behavior, can increase the likelihood of experiencing financial distress [3][4][5]. Therefore, it is very crucial to manage everything related to finances wisely by utilizing adequate financial knowledge as well as the application of financial behavior. Adequate financial knowledge and financial behavior can minimize the occurrence of financial difficulties in the worst circumstances that may occur unexpectedly. The level of financial literacy and financial behavior can indicate whether or not a person's financial knowledge and behavior are adequate. Financial literacy is considered a means to accelerate financial well-being, therefore, having financial literacy will help people with day-to-day financial tasks, deal with some financial emergencies, and even pull them out of the grip of poverty [6]. Individuals who are financially literate will be able to avoid financial problems, especially during the COVID-19 pandemic [7]. In Indonesia, according to the Financial Services Authority (Otoritas Jasa Keuangan (OJK)) which conducted a survey about financial literacy and financial inclusion in 2019 that covers 34 provinces and includes 12,773 respondents, the rate of financial literacy in Indonesia is 38.03% and the level of financial inclusion index is 76.19 [8]. Based on the survey, both of financial literacy index and the financial inclusion index in 2019 increased compared to the previous survey in 2016. Although the financial literacy index has increased since the previous survey in 2016, the percentage of financial literacy is much lower than the percentage of financial inclusion. This means that many people have access to, and even own various financial products, but they are unaware of the benefits and risks. Lower financial literacy can cause people to struggle financially from paycheck to paycheck, with little or no savings, and ultimately very likely to experience financial distress. Individuals who are financially literate, on the other hand, will be able to avoid financial distress, particularly throughout the COVID-19 pandemic [7]. Talking about the financial distress experienced by many people due to the Covid-19 pandemic, Standard Chartered in 2020 has conducted a global survey of 12,000 adults in 12 countries (Hong Kong, India, Indonesia, Kenya, Mainland China, Malaysia, Pakistan, Singapore, Taiwan, UAE, UK, and US). The survey results are that COVID-19 has had a major impact on spending and the savings of many people from various generations, and generation Y (ages 25-44 years) is the most affected. Generation Y is more likely than any other generation to find it difficult to meet daily expenses

and to have a higher level of the take-out loan. Despite these obstacles, the pandemic has galvanized generation Y to adequately plan for their financial health and encouraged them to change their financial management behavior. However, based on data from Statistics Indonesia Agency (Badan Pusat Statistik (BPS)), generation Y and generation Z are the generations most affected by the COVID-19 pandemic, the impact experienced is a reduction in working hours, which has implications for a decrease in wages [9]. Especially, based on the results of the 2020 Population Census, Generation Z (27.94%) and Generation Y (25.87%) dominate the total population of Indonesia [1]. This implies that the pandemic has had a negative impact on a large number of Indonesians. According to a report from United Nations Children's Fund (UNICEF), during the pandemic, three out of four Indonesian households saw their income fall, with urban families faring the worst. At the same time, nearly a quarter of households are facing higher costs and an increased risk of food insecurity. Many middle-income people become impoverished or vulnerable. People in all income groups—from the poorest to the richest—reported similar percentages of income declines, implying that many previously economically secure people became poor or were on the verge of becoming poor [10]. The causes of the decline in income during this pandemic could be various, such as a reduction in working hours which has implications for wage reduction, and even there are some Indonesians have lost their jobs, this is consistent with data showing that Indonesia's unemployment rate is rising. In February 2020, BPS revealed that in Indonesia there were 6.88 million unemployed, this number increased by 60,000 people compared to the same period in 2019. The unemployment rate reached 4.99% of the total workforce of 137.91 million people. Especially, there is three hundred thousand fewer youth entering the labor market during the same period. Meanwhile, according to Agus Eko Nugroho, Head of the Indonesian Institute of Sciences Economic Center (Lembaga Ilmu Pengetahuan Indonesia (LIPI)), based on results of research conducted by the Indonesian Institute of Sciences in 2020, 87.3% of business owners and 64.8% of workers feel they are experiencing financial distress during the pandemic. Most people take advantage of their savings, assets, and loans from relatives to maintain purchasing power. Besides that, both workers and business owners find it difficult to pay bills and installments during the pandemic [11]. With an increasing number of unemployed people, an increasing number of people at risk of falling into poverty due to reduced or even lost sources of income, and many people struggling to pay bills and installments during the covid-19 pandemic, this means and implies that the Indonesian people are experiencing financial distress. Economically, the Indonesian people are unprepared to deal with the country's economic paralysis. The lack of financial literacy

among people contributes to their lack of preparedness. Financially illiterate people are more likely to be exposed to immoral formal and informal financial institutions, incurring high return costs [7]. Furthermore, according to OJK data as of December 2020, the number of Indonesians who make loans are increasing. There were 43.57 million borrower accounts (loan recipients) and most of the borrowers were aged 19-34 years (which means they are generations Y and Z). Loan distribution is still mostly centered on the island of Java, total new loans in Jakarta reached Rp20.68 trillion, West Java Rp20.53 trillion, Banten Rp6.67 trillion, Central Java Rp20.53 trillion, and East Java Rp8.18 trillion. However, this rapid disbursement was followed by a decrease in the compliance level of borrowers to pay installments before 90 days from 96.35% in the previous year to 95.22% in 2020. In July 2021, the percentage of non-performing loans grew by 3.01% compared to the previous month (month to month/m-to-m) and also increased by 4.35% compared to July 2020 (year on year/oy). Based on the type of use, the largest non-performing loans were for capital loans of Rp110.46 trillion, or 4.38% of the total loans. Next, investment loans are Rp44.89 trillion or 3.04% of the total loans granted, and loans for consumption are Rp30.81 trillion or 1.97% of the total loans. Therefore, this study aims to analyze the relationship between financial literacy and financial behavior towards personal financial distress in generations Y and generations Z. This research will focus on the Bandung area because it is one of the cities in West Java, and West Java, as previously stated, is one of the provinces with a high loan disbursement.

B. Literature Review

O'Neill, Sorhaindo, Prawitz, Kim, and Garman in 2006 describe financial distress as a stress response characterized by mental or physical discomfort about one's overall financial well-being. This definition refers to beliefs about one's ability to manage wealth, such as paying bills, repaying debts, and meeting one's basic needs and desires [12]. A person's financial distress level is determined objectively by facts such as the amount and predictability of the person's income, assets, and debt. However, financial distress can also be understood subjectively because some people may feel differently distressed about their finances more than other people even though under the same circumstances (the same income, assets, debt, and so on) [13].

Financial literacy is defined as an indicator of one's understanding of key financial concepts and skill in managing personal finances through adequate, short-term decision-making and appropriate, long-term financial planning while keeping paying attention to economic circumstances and life situations [14]. Similarly, OJK defined financial literacy as the knowledge, skills, and

beliefs that influence attitudes and actions to improve the quality of decision-making and financial management to achieve prosperity. Foo Yu and Jupri in 2015 researched the respondent's internal factors such as spending habits, savings habits, financial management, and financial literacy. As a result, the independent variables of spending habits, savings habits, and financial management have a positive linear correlation with the dependent variable of financial distress. The remaining variable, financial literacy and financial distress have a positive but weak linear correlation [15]. In 2013, Idris examines the relationship between financial literacy and financial distress with the object of study was Malaysian youth. The study also reveals a positive but weak relationship between financial literacy and financial distress [5].

H1: Financial literacy has a positive relationship with financial distress

Financial behavior can be defined as the study of how people actually behave in financial decision-making (a financial setting)[16][17]. Marlina in 2019 has been analyzed financial behavior traits' impact on financial distress, then the finding was financial behavior has a positive effect on financial distress, and the effect is significant. Financial behavior in that study used 3 indicators consists of capacity for self-control, planning, and patience.

H2: Financial behavior has a positive relationship with financial distress

II. METHODOLOGY

A. Financial Literacy Index Calculation

To create a financial literacy index in this study refers to the method developed by the OJK in 2013. Overall, calculating the financial literacy index entails several steps, including providing a score for every variable, measuring the weight for each variable, and finally establishing a financial literacy index. The first step is to give a score for every variable, each questionnaire question received a score of one for correct answers and zero for incorrect answers (including do not know). The second step to calculate the financial literacy index is measuring the weight, the author used a simple weight approach wherein every variable from every variable group was given equal weight. Equation (1) shows the formula for calculating weight for every financial literacy variable, by dividing 1 with the total number of questions in the questionnaire

$$\text{Financial Literacy Weight} = 1/N \quad (1)$$

Where:

N : total number of questions in the questionnaire.

The Financial Literacy Index is then generated for each observation in each group of variables (basic and advanced) Equations (2) and (3) show the formula for calculating the basic and advanced financial literacy index by multiplying the total score of the variables and the weight of the correlation. The basic and advanced financial literacy index scores are multiplied by 100 for better interpretation.

$$FLI \text{ Basic} = \text{score}.\text{weight}.100 \quad (2)$$

$$FLI \text{ Advanced} = \text{score}.\text{weight}.100 \quad (3)$$

Where:

FLI Basic : basic financial literacy index
FLI Advanced : advanced financial literacy index

Score : the score of respondent in answering questions of basic or advanced financial literacy in questionnaire

Weight : the simple weight of basic or advanced financial literacy variables

After calculating the basic and advanced financial literacy indexes for each observation, the total score financial literacy index for each respondent is calculated. Equation (4) shows the formula for calculating the overall financial literacy index.

$$FLI = 0.5.FLI \text{ Basic} + 0.5.FLI \text{ Advance} \quad (4)$$

Where:

FLI : total financial literacy index
FLI Basic : basic financial literacy index
FLI Advanced : advanced financial literacy index

To interpret the financial literacy index, in Indonesia, OJK categorizing the financial literacy index into three group, such as low, moderate, and high literate [18]. Table 1 describe the interpretation of financial literacy index.

Table 1 - FINANCIAL LITERACY INDEX INTERPRETATION

Score	Interpretation
Financial literacy index $\leqslant 60$	Low literate
$60 < \text{Financial literacy index} \leqslant 80$	Moderate literate
$\text{Financial literacy index} > 80$	High literate

B. Financial Distress Index Calculation

The author uses the IFDFW method to calculate the financial distress index in this study. The financial distress index is calculated by adding up all the numbers given by the respondents from answering the 8 questions in the questionnaire. After that, the total score will be divided by 8 to calculate the index. Individual scores can range from 8 (one point for each question) to 80 (10 points for each question) While the financial distress index will range from

1 (the highest financial distress index) to 10 (the lowest financial distress index). The whole outcome could further reflect the level of financial distress/financial well-being experienced by the individual.

Table 2 is the interpretation of the financial distress index [19].

Table 2 - IFDFW SCORE INTERPRETATION

Score	Interpretation
1.0-1.9	Overwhelming financial distress
2.0-2.9	Extremely high financial distress
3.0-3.9	Very high financial distress
4.0-4.9	High financial distress
5.0-5.9	Average financial distress
6.0-6.9	Moderate financial distress
7.0-7.9	Low financial distress
8.0-8.9	Very low financial distress
9.0-9.9	Extremely low financial distress
10.0	No financial distress

C. Financial Literacy, Financial Behavior, and Financial Distress

Multiple linear regression was used in this study to examine the relationship between the financial literacy index and financial behavior toward the financial distress index.

III. RESULTS

A. Financial Literacy Index

Utilizing a simple weighted scale from 0 to 100, the average score of basic financial literacy of Bandung's generations Y and Z is 67.9. Whereas, the average score of advanced financial literacy of generations Y and Z in Bandung is 60.5. Thus, the average overall financial literacy index of generations Y and Z in Bandung is 64.2. The financial literacy index shows that the level of financial literacy of generations Y and Z in Bandung is categorized as moderate literate. Specifically, the results from the questionnaire revealed that more than half of the respondents that is 119, or 51%, had a financial literacy index equal to or higher than the average value of the financial literacy index of 64.2.

In this study, generations Y and Z has various literacy levels, ranging from low literate to high literate when classified by gender, education level, and income level. Men in generations Y and Z with as many as 100 people have an average financial literacy index of 68.7, whereas women with as many as 134 people have an average financial literacy index of 60.9. When classified by education level, those with a master's degree have an average financial literacy index of 80.6, while those with the lowest education level in this study, elementary school education, have an average financial literacy index

of 45. Afterward, when income level is classified, people in generations Y and Z with incomes greater than IDR 20,000,000 per month, with as many as 6 people, have an average financial literacy index of 83.1, whereas those with the lowest incomes in this study, less than IDR 5,000,000 per month, with as many as 178 people, have an average financial literacy index of 62.4.

From the categorization of financial literacy index based on the level of education and income level, there seems a trend that tends to continue to go up, which means the higher a person's level of education or income level, the greater the possibility of having a higher financial literacy index. However, these findings require further investigation.

B. Financial Distress Index

Individual financial distress index ranges from 1 to 10. Overall, in this study, the people of Bandung who were born between 1981-2004 with as many as 234 people, have an average financial distress index of 6.2. This index result indicates those people experienced moderate financial distress.

When categorized by gender, men with as many as 100 people have an average financial distress index of 6.6, whereas women with as many as 134 people have an average financial distress index of 6.0. Both women and men can be interpreted to experience moderate financial distress. Furthermore, when categorized by income levels, as many as 6 people whose income is higher than IDR 20,000,000 had an average financial distress index of 8.0, in other words very low financial distress. While as many as 178 people, who have the lowest income levels in this study, below IDR 5,000,000 had an average financial distress index of 6.0, meaning moderate financial distress. Subsequently, when categorized based on education levels, generations Y and Z whose last education level is master's degree had an average financial distress index of 6.8. Whereas people with the lowest education level on this study, that is elementary school had an average financial distress index of 2.5. The financial distress index that is categorized based on education level and income level consistently shows a trend that tends to go up. This might imply that the higher a person's level of education or income level, the more likely it is to have a higher index of financial distress which means less likely to be in financial distress. These findings, however, necessitate further investigation.

C. Relationship Between Financial Literacy and Financial Behavior Toward Financial Distress

The percentage of the total variance in the dependent variable (financial distress) that can be predicted from

the independent variables (financial literacy and financial behavior) is denoted by R-Square. Based on multiple linear regression results in this study, the R-squared is 17.7%, which indicates that 17.7% of the variance in financial distress can be predicted from the variable financial literacy and financial behavior. Whereas, 82.3% are influenced by variables not identified in this study. Furthermore, the value of the coefficient correlation (R) is 0.421, indicating that there is a moderate relationship between the dependent and independent variables, as proposed by Hopkins, a correlation coefficient value between 0.3 and 0.5 implies a moderate relationship [20].

Equation (5) shows the model generated in this study. Financial literacy will increase the financial distress index by 0.005 if there is an addition of one percentage point. The addition of one point of financial behavior will increase the financial distress index by 4.089.

$$FDI = 4.293 + 0.005FLI + 4.089FB + \epsilon \quad (5)$$

Where:

FDI : Financial Distress Index

FLI : Financial Literacy

FBI : Financial Behavior

ϵ : Error

Table (3) show that financial literacy has a coefficient of 0.005 and a p-value of 0.354 which indicates that financial literacy has a positive relationship with financial distress but statistically not significant, thus H₁ is not supported. Whereas financial behavior has a coefficient of 4.089 and a p-value of 0.000, it implies that financial behavior has a positive relationship with financial distress and is statistically significant because the p-value is lower than 0.05, thus H₂ is supported.

Table 3 - HYPOTHESIS TESTING RESULT

Hypothesis	Coefficient	Significant Level	Conclusion
H ₁ Financial literacy has positive relationship with financial distress	0.005	0.354	Positive, not significant
H ₂ Financial behavior has positive relationship toward financial distress	4.089	0.000	Positive, significant

IV. DISCUSSION

The financial literacy index is the result of the answer to 10 basic financial literacy questions and 9 advanced financial literacy questions. Based on the calculation of the financial literacy index, the finding was the average overall financial literacy index for generations Y and Z in Bandung is 64.2, indicating a moderate level of financial literacy. According to the results, it can also be revealed that more than half of the respondents (51%) had a financial literacy index equal to or higher than the average value of the financial literacy index of 64.2. According to the findings, generations Y and Z in Bandung experienced moderate financial distress during the COVID-19 pandemic, with an average financial distress index of 6.2. In other words, generations Y and Z in Bandung are experiencing financial distress but are not extremely depressed. They may feel the negative impact in terms of finances caused by the covid-19 pandemic, but it is not significant enough to make them feel very uncomfortable or depressed about their financial situation. Additionally, both of financial literacy index and financial distress index, when categorized based on income and education level, shows a tendency that the higher the income earned or the higher level of education level, the higher the level of satisfaction with financial conditions, thus resulting in the lower the level of financial distress. However, this is need further investigation because not covered in this study and the proportion of the respondent in each category is not adequate to be compared.

According to the multiple linear regression model, there is a positive and moderate relationship between the dependent and independent variables. A one-point increase in financial literacy raises the financial distress index by 0.005, while a one-point increase in financial behavior raises the financial distress index by 4.089. In other words, the higher the level of financial literacy and financial behavior, the lower the level of financial distress experienced because a higher financial distress index indicates a lower level of difficulty, as indicated by the descriptive terminology of IFDFW, the highest score for the financial distress index is 10, indicating no financial distress or the highest level of financial well-being. This study's findings are compatible with previous research by Marlina in 2019, Foo Yu and Jupri in 2015, and Idris in 2013, which found a positive relationship between financial literacy and financial distress, as well as a positive relationship between financial behavior and financial distress [16][15][5].

Overall, the findings of this study show that more than half of respondents have a higher financial literacy index than the study's average, which was 64.2. Whereas the majority of respondents, as many as 65%, have a financial behavior index that is higher than the average financial behavior

index in this study, which was 0.4. Besides, nearly half of the respondents, have a financial distress index greater than the study's average financial distress index of 6.2. All of these findings are reflected in the multiple linear regression results, which show that individuals with higher levels of financial literacy and better financial behavior tend to have a higher financial distress index. For the real interpretation, individuals who are more financially literate, for example understanding the concepts of interest, inflation, time value of money, financial products and returns, and then implementing good financial behavior such as spending less than income, prepare for retirement funds, already have an emergency fund, have insurance will not worry about meeting their living expenses, thus tend to be more satisfied with their financial situation, not worried, and less financially distressed.

V. CONCLUSION

This study aims to analyze the level of financial literacy of generations Y and Z in Bandung, to find out whether generations Y and Z in Bandung experience financial distress during the Covid-19 pandemic, and lastly to identify the relationship between financial literacy index and financial behavior index toward financial distress index. The first findings showed that generations Y and Z in Bandung have a moderate level of financial literacy with an average score of 64.2. The second finding was during Covid-19 pandemic, generations Y and Z in Bandung experienced moderate financial distress with an average score of 6.2. Lastly, the third finding was there is positive and moderate relationship between financial literacy and financial behavior toward financial distress. Which indicates that any increase in the number of financial literacy index and financial behavior index will increase the number of financial distress index. The multiple linear regression results also imply that people who are more financially literate, like understand the concepts of interest, inflation, time value of money, financial products, and returns, and at the same time implement good financial behavior such as spending less than income, saving for retirement, having an emergency fund and insurance, will not worry about meeting their living expenses, and thus tend to be more satisfied with their financial conditions.

The result of this study is financial literacy and financial behavior have a positive and moderate relationship toward financial distress. However, in this research, the variable financial literacy and financial behavior can only predict as much as 17.7% of financial distress. Therefore, further research can add other variables that can increase the percentage of predictions, such as financial attitude, financial management, and many more. In addition, this research is only focused on being carried out in one geographic area of one country, which may limit the representativeness of the sample from each strata of

society. Thus, to obtain a more overview of the complete, future studies may need to maximize the number of samples as much as possible and take proportions into account when comparing generations. The authors believe that more respondents will provide a more reliable and more even picture of the population, which in turn can lead to better results. In addition, further research can also investigate more about the correlation between education level and income on the financial literacy index or financial distress index, with the appropriate number of respondents being compared in each category.

Since there seems a pattern of the economic recession that usually occurs every decade, and in the end can directly affect each individual's personal finances, it is preferable for each individual to be aware of the need to improve financial literacy and financial behavior in order to properly manage personal finances and making a better financial decision. Like the findings in this study, by increasing financial literacy and better financial behavior, individuals can reduce the likelihood of experiencing financial distress in life, especially when many unexpected things occur such as pandemics or economic recessions.

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Paper 47

Settlement Scheme For Debt Financing Using Mezzanine With Warrants (Study Case: PT Garuda Indonesia (Persero) Tbk)

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Abstract - Since the spread of Covid 19 in China in December 2019, all sectors have been affected by COVID-19, including the aviation industry. This resulted in a decrease in the number of flight passengers and decreased the company's operational and financial performance, including PT Garuda Indonesia (Persero) Tbk. Furthermore, the decline in the company's performance resulted in it experiencing liquidity difficulties and an inability to pay its short-term liabilities. The research was conducted to solve those problems with the case study research method, where the authors searched for and collected publicly available data and performed simulations that could be applied by PT Garuda Indonesia (Persero) Tbk. This problem can be solved using a mezzanine with warrants scheme, where the company will lend money to private equity, and interest payments will be paid yearly. In addition, at maturity, the mezzanine loan will be converted as collateral with a value that meets the agreed internal rate of return. The warrants will be exercised into shares. Therefore, the private equity shares ownership of PT Garuda Indonesia (Persero) Tbk.

Keywords - Debt Financing, Financial Restructuring, Mezzanine

I. INTRODUCTION

The Covid-19 pandemic has spread to almost all countries in the world which affects various businesses. To compress the spread of Covid-19, numerous countries have implemented national lockdowns such as England, Croatia, Argentina, Pakistan, New Zealand. Then some countries only carry out local lockdowns such as the US and Brazil. Indonesia, Japan, and several other countries only restrict the activities of citizens (Dunford et al, 2020). In 2021, after a new variant of the Covid-19 virus was discovered and spread, several countries such as Singapore re-imposed the lockdown that they had implemented (Park, 2021). So that, the Covid-19 pandemic has disrupted people's lives and created several changes (Thomas et al, 2021). There are still uncertainties for the long run for varied aspects as well as business.

One of the sectors that have been severely affected by the COVID-19 pandemic is the aviation industry (Pallini, 2020). From the consumer side, passengers avoid flights to prevent being exposed to COVID-19. From the regulator's point of view, making policies related to regional

closures and the existence of strict protocols related to travel. Lockdown policies that have implemented by many countries forced airlines to stop services. Overall, the COVID-19 pandemic has resulted in a significant reduction in travel (Ozbilen et al, 2021).

At the beginning of the pandemic when many countries-imposed lockdowns, many airlines cancelled their flights suddenly. For instance, from January to February 2020, PT Angkasa Pura (Persero) reported that as many as 12,703 flights with an estimated number of 1.67 million passengers were cancelled at 15 airports throughout Indonesia (Mufti, 2020). From April 2020 to May 2020, the number of passengers in Indonesia fell -89.62% (Soelasih and Sumantri, 2020). The cancellation also occurred in other countries. The year 2020 was the start of a disaster for the aviation industry. 2020 is the year when the COVID-19 outbreak spreads throughout the world, so many countries have implemented lockdowns and travel restrictions for their citizens.

The International Air Transport Association (IATA) said that global passenger traffic for 2020 showed demand (RPK or revenue passenger per kilometre) fell by -65.9% YoY compared to 2019 which was the most significant decrease in traffic in aviation history. In 2020, flight traffic for airlines in the Asia Pacific decreased by -80.3% YoY compared to 2019. The Covid-19 pandemic caused the aviation industry in 2020 to experience negative growth. Although going forward, the government is also trying to continue to provide fiscal and monetary stimulus and provide vaccines that can help reduce infection rates.

The number of international passengers in 2020 was -75.6% below 2019. Capacity (Available Seat Kilometres) in 2020 decreased by -68.1% YoY and load factor decreased by 19.2 points YoY. Meanwhile, the number of domestic passengers in 2020 fell -48.8% YoY compared to 2019. Available Seat Kilometres to fell to -35.7% YoY and load factor decreased by 17 percentage points to 66.6%. Meanwhile, IATA estimates that in 2021 there will be an increase of 50.4% compared to 2020, but this increase is only at the level of 50.6% of the flight traffic in 2019.

Garuda Indonesia's domestic market share declined by -9.34 percentage points, while Citilink's domestic market share climbed by 1.29 percentage points, for a total decrease of -8.05 percentage points for the Garuda

Indonesia Group. Garuda Indonesia Group's market share on international flight routes increased by 0.83 percentage points year on year in 2019.

Until now, the economic conditions in Indonesia and the world are still affected by the Covid-19 pandemic. This directly affects the operational performance and financial performance of PT Garuda Indonesia Tbk. The number of passengers as of December 2020 Garuda's Group decreased significantly by 66.11% YoY compared to the number of passengers before the pandemic. The decline in the number of passengers was caused by many countries and regions in Indonesia that imposed travel restrictions. The decrease in the number of passengers was also followed by a decrease in the amount of cargo.

According to IATA, this condition will occur for the next 5 (five) years to return the number of passengers to their pre-pandemic state. Although there was a decrease in revenue during the Covid-19 pandemic, it was not followed by a decrease in operational expenses, causing PT Garuda Indonesia (Persero) Tbk to experience a net loss and a decrease in company liquidity. In addition, the amount of cash and cash equivalents of PT Garuda Indonesia (Persero) Tbk during the pandemic decreased compared to before the pandemic.

However, the significant decline in revenue during the COVID-19 pandemic was not accompanied by a decrease in operating expenses incurred, causing PT Garuda Indonesia to experience a net loss and negative impact on the company's equity as well as a decrease in liquidity and a decrease in the level of cash equivalents of Garuda Indonesia if compared to conditions in 2019 before COVID-19 took place.

Problems related to liquidity risk indicate a risk that arises where the position of cash inflows of PT Garuda Indonesia (Persero) Tbk from short-term income is not sufficient to meet cash outflows for short-term expenses. As a result, the company experiences liquidity and delays the payment of various maturing liabilities.

Until now, PT Garuda Indonesia (Persero) Tbk has postponed its debt payment obligations, among others, to PT My Indo Airlines, PT Mitra Buana Koorporindo, and several other companies. In addition, the company also received a lawsuit for default related to the delay in payment of aircraft leases to AerCap Ireland Limited, SMBC Aviation Capital Limited, and Helice Leasing S.A.S. The company's difficult liquidity has also caused PT Garuda Indonesia (Persero) Tbk to be unable to make payments of principal and interest related to the USD 500 million Sukuk. Thus far, the company is proposing to change the maturity of the Sukuk from June 3, 2020, to June 3, 2023.

Table 1 - INTEREST BEARING DEBT OF PT GARUDA INDONESIA (PERSERO) TBK FY19 – 9M21

In Million IDR	30-Sep-21	31-Dec-20	31-Dec-19
Short-term loans	948,577,908	805,272,996	984,853,063
Factoring liabilities	-	94,019,723	54,570,560
Long-term loans	80,669,209	51,068,979	141,779,239
Lease liabilities	1,949,948,178	1,505,258,580	52,533,237
Bonds payable	494,390,666	492,074,369	498,996,741
Asset-backed securitisation loan	66,034,063	25,522,846	25,897,408
Mandatory convertible bonds	69,746,056	-	-
Long-term loans	378,717,038	248,159,518	1,597,426
Lease liabilities	3,959,206,867	4,493,564,698	35,340
Asset-backed securitisation loan	-	51,045,692	77,692,229
Total	7,947,289,985	7,765,987,401	1,837,955,243

To overcome this, the researcher offers a financing option through mezzanine financing, which is a hybrid financing instrument whose position is lower than that of a senior loan or does not require collateral. The issuance of mezzanine financing is also much less complicated than other debt financing or equity financing options. In addition, researchers also offer options with mezzanine financing combined with warrants which are considered an equity kicker for private investors or strategic investors.

II. METHODOLOGY

Case study research is becoming more common among qualitative researchers (Thomas, 2011). Researchers who use the case study method must first determine the research setting for their case (industry, region, etc.). Researchers must prove that this case study is a phenomenon and interesting to study. Therefore, researchers should be able to determine how case studies will need to emphasize how they can make a theoretical contribution against their chosen research background and whether this contribution can be generalized through replication.

Once the research setting is selected, the researcher must consider which companies to include and which issues to choose within each company. Continuing the research theme related to financial restructuring, the researchers need to determine the criteria used to select the company. The company was chosen because they are currently undergoing a lawsuit process related to debt restructuring. Case selection is essential not only for empirical studies but also for a literature review so that the latter will be able to justify and frame empirical studies.

As mentioned in the background, several studies on corporate debt restructuring in several countries have been conducted. Therefore, this raises the author's interest in researching the settlement of debts of PT Garuda

Indonesia (Persero) Tbk. Following a thorough examination of the literature, the authors chose the case study as the major research approach. A qualitative technique was used to gather, analyse, and conclude all data (Yin, 2011). Case study research is an empirical method that delves deeply into contemporary events in real-world contexts. When the boundaries between phenomena and context are unclear, the case study method is extremely useful.

A common criticism of the case study method is the lack of documentation and standards regarding the methodology. At the same time, the case study method is one of the most widely used methods to understand contemporary phenomena – both formally and of course informally in learning something and developing new research theories and hypotheses. This method still lacks credibility and substantial literature explaining how to conduct case studies and maintain research forms as valid investigation forms (Yin 2018).

The features of case study research relate to technically different situations with more variables of interest than data points where pre-existing theory will assist in guiding development, design, data collection, and data analysis (Yin, 2018). Therefore, the author uses a conceptual framework that has been developed by Yin (2018) as a basic outline as follows:

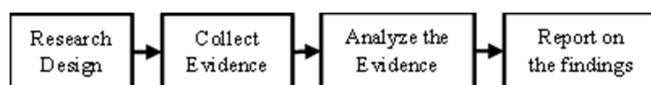


Fig. 1. Methodology.

III. RESULTS

A. Financial Projection

Estimation of the company's future financial outcomes is required to serve as the basis for calculating free cash flow, which will be used for stock valuation. As a result, the income statement will be predicted and used to generate the inputs. as the subject of projection, the following key accounts will be estimated operating revenue, operating expense, finance income, finance cost, depreciation expense, income tax expense

The primary assumption used to calculate the projected operating revenue is passenger revenue based on the growth in the number of passengers, revenue-passenger kilometres (RPK), the number of aircraft, an average of available kilometres (ASK), and an average ticket price. For cargo revenue, the significant assumptions used are the amount of cargo and the cargo price. For other income in operating revenue, the assumption used is the average growth of the last five years.

The assumptions used for operating expenses will be based primarily on operating revenue percentages based on historical performance before covid. Assumptions Finance income is based on the value of deposit interest, and the assumption of finance costs is the average interest paid by the company. Finally, the income tax expense assumption will use the income tax rate in Indonesia is 22%.

The balance sheet summarizes the company's fundamental situation based on its resources, commitments, and equity. The balance sheet forecast will be prepared to aid in the estimation of inputs utilized in stock valuation in the coming years. The following accounts will be projected Cash and Cash Equivalent, Trade Receivables-Related Parties, Trade Receivables-Third Parties, Inventory, Fixed Asset, Trade Payables – Related Parties, Trade Payables – Third Parties, Accruals, Long Term Trade Payables, Interest Bearing Debt, Mezzanine Financing, Share Capital, Retained Earnings.

By using the average financial ratio and comparing the specific accounts to its historical performance indicators, the assumptions employed in forecasting the balance sheet are derived based on its historical performance. Some balance sheet accounts are assumed to be flat.

B. Cash Available for Debt Services and Debt Sizing

From the results of the calculation of Cash Available for Debt Services, using the EBITDA formula reduced by tax minus or added by Changes in Working Capital and reduced by Acquisition of Assets

Table 2 – CASH OF AVAILABLE OF DEBT SERVICES (CFADS)

Period	CFADS (in full USD)	Discount Rate	PV of CFADS (in full USD)
0	122,999,935	1.00	122,999,935
1	199,158,016	1.06	188,426,568
2	804,805,460	1.12	720,409,790
3	829,572,700	1.18	702,566,584
4	562,644,947	1.25	450,828,961
5	811,806,008	1.32	615,423,380
6	840,257,260	1.39	602,668,301
7	437,419,748	1.47	296,830,694
8	899,012,950	1.56	577,192,548
9	966,953,737	1.65	587,360,599
Total	6,474,630,763		4,864,707,361

For ten years, the value of GIAA's Cash Available for Debt Services is only USD 6.47 billion, and if we present the value, it is only worth USD 4.86 billion. At the same time, the total interest-bearing debt from GIAA is USD 7.95 billion. This shows that the GIAA still needs funds arounds of USD 3.08 billion to pay off the interest-bearing debt.

Table 3 - SIMULATION OF DEBT SIZING

	A	B = D0	C	D = A+B-C
Year	CFADS	Beginning Balance	Total Debt + Interest	Cash Ending Balance
2021	122,999,935	41,699,860	47,584,695	117,115,100
2022	199,158,016	117,115,100	2,798,837,858	(2,482,564,742)
2023	804,805,460	(2,482,564,742)	1,039,056,774	(2,716,816,056)
2024	829,572,700	(2,716,816,056)	975,051,383	(2,862,294,739)
2025	562,644,947	(2,862,294,739)	970,845,509	(3,270,495,300)
2026	811,806,008	(3,270,495,300)	457,569,887	(2,916,259,179)
2027	840,257,260	(2,916,259,179)	281,555,269	(2,357,557,188)
2028	437,419,748	(2,357,557,188)	99,797,323	(2,019,934,763)
2029	899,012,950	(2,019,934,763)	98,938,406	(1,219,860,218)
2030	966,953,737	(1,219,860,218)	97,077,418	(349,983,900)

If GIAA does not take corporate action, the result is that from 2022 to 2030, GIAA will experience a negative cash ending balance. The maximum value of the negative cash ending balance will occur in 2025, which is USD 3.27 billion. This shows that GIAA will go bankrupt because it is unable to pay its obligations.

C. Debt Sizing with Mezzanine with Warrant

If using a mezzanine with warrants, it is assumed that GIAA will obtain financing from 2022 to 2025 in the amount of USD 3.75 billion and pay interest of USD 617.5 million, assuming an interest rate of 5% p.a, then from 2021 to 2030, GIAA will not experience a negative cash ending balance.

Table 4 - SIMULATION OF DEBT SIZING WITH MEZZANINE

Year	A	B = F0	C	D	E	F=
						A+B-C+D-E
2021	179	42	48	-	-	173
2022	1,214	173	2,799	2,530	-	1,118
2023	977	1,118	1,039	360	127	1,289
2024	944	1,289	975	290	145	1,404
2025	925	1,404	971	570	159	1,769
2026	838	1,769	458	-	188	1,962
2027	800	1,962	282	-	-	2,480
2028	843	2,480	100	-	-	3,223
2029	861	3,223	99	-	-	3,986
2030	894	3,986	97	-	-	4,783
Total	7,581	-	6,769	3,750	618	-

D. Valuation of PT Garuda Indonesia (Persero) Tbk

The Discounted Cash Flow valuation method is used to calculate the company's intrinsic value as the present value of predicted future cash flows. The total cash flow from operations accessible after depreciation, costs, taxes, working capital, and capital expenditures is known as free cash flow to firm (FCFF).

The FCFF formula is as follows:

$$=EBIT - \text{Tax} + \text{Depreciation or Amortization} - \text{Changes in Working Capital} \quad (1)$$

First, we need to compute the Profit Before Interest and Tax (EBIT) which we can get by referring to the income statement and the reduction of tax expense, which will then be identified as Net Operating Profit After Tax (NOPAT). Furthermore, depreciation expense or amortization expense is added because the expense does not affect the cash flow performance. After that, there is a reduction or addition of changes in working capital. And finally, the reduction of Capital Expenditure (CAPEX) CAPEX is obtained by determining the movement of Property, Plant & Equipment plus depreciation costs.

The findings of the FCFF computation at the end of forecasting will then be used to calculate the company's terminal value by multiplying the most recent cash flow (year 10) by the terminal growth rate. The terminal growth rate utilized by the author in this computation is 3.04 percent, which is based on the OECD's forecasted compound annual growth rate of Indonesia's GDP growth from 2031 to 2060. Indonesia's GDP in 2031 is estimated to reach USD 5.52 trillion, and in 2060 it will reach USD 12.3 trillion. The terminal value obtained is USD 32.7 billion, and if the present value is USD 22.1 billion, the value of the Sum of PV from 2022 to 2030 is USD 4.4 billion.

Valuation =

$$\text{PV of Terminal Value} + \text{Sum of PV of FCFF} + \text{Cash} - \text{Debt} \quad (2)$$

Valuation of PT Garuda Indonesia (Persero) Tbk =

$$\text{USD } 22,130,390,647 + \text{USD } 4,418,069,895 + \text{USD } 41,699,860 - \text{USD } 7,947,289,985 = \text{USD } 18,642,870,417$$

WACC is calculated by using equation 3. WACC is used as discounting forecast cash flow. To calculate WACC, Cost of Debt and Cost of Equity must be defined first.

WACC =

$$\text{Cost of Equity} / \text{Equity} + \text{Debt} / \text{Equity} + \text{Cost of Debt} / \text{Debt} \quad (1 - \text{tax rate}) \quad (3)$$

The total debt used is the total interest-bearing debt owned by PT Garuda Indonesia (Persero) Tbk, which is USD 7.94 billion. Meanwhile, the total equity uses the last market value and cannot use the equity value because PT Garuda Indonesia (Persero) Tbk has a negative equity value.

To calculate the market value in USD, the following formula is used:

Market Value =

$$\text{Last Price} \times \text{Number of Shareholder Share} / \text{IDR/USD}$$

(4)

Market Value =

$$\text{IDR } 222 \times 25,886,576,254 / \text{Rp} 14,661 =$$

$$\text{USD } 391,980,078$$

Therefore, debt portion is 95.20% from (7.94 Billion/ (USD 391.9 Million + 7.94 Billion) and equity portion is 4.80% from (USD 391.9 Million / (USD 391.9 Million + 7.94 Billion)

In conclusion, WACC value is as follows:

$$\text{WACC} = 16.36\% \times 4.80\% + 5.70\% \times (1 - 22\%) \times 95.20\% = 5.01\%$$

GIAA obtains the range of interest rates varies widely. The minimum value of the interest rate is 0.21% p.a. GIAA obtained the rate from the Japan Finance Corporation, which is a special loan. Meanwhile, the highest rate is the rate that comes from PT Bank Negara Indonesia (Persero) Tbk, which is 10.75% p.a. If the interest is calculated using the average, a value of 5.69% will be obtained. The average calculation result is equivalent to the weighted average of loans obtained by GIAA, which is 5.70%. The weighted factor of the Weighted Average of the Interest Rate is the number of existing GIAA loans.

The cost of equity is the return expected by investors to decide that the investment made meets the capital return requirement. In calculating the cost of equity, we can use the capital asset pricing model so that we get the following equation:

Cost of Equity =

$$\text{Risk-Free} + \text{Beta} \times (\text{Expected Market Return} - \text{Risk-Free Rate})$$

(4)

The Risk-Free Rate is the rate of return assumed to have a risk close to zero. In this case, the risk-free rate used is the Indonesian Government Bonds Yield 10 Years per 22 May 2022. The risk-free rate is 7.22%. At the same time, Beta is used to calculate the calculated risk based on the company's stock price regressed. The beta stock used for GIAA is 1.49.

The beta stock results from calculations carried out by PT Pemeringkat Efek Indonesia or PEFINDO per 19 May 2022.

The risk premium value is 6.12%. This figure comes from the calculation of the equity risk premium in Indonesia, which is calculated by Aswath Damodaran, a professor from New York University in the field of Finance.

From these assumptions, the cost of equity from GIAA is obtained as follows:

$$\text{Cost of Equity} = 7.22\% + 1.49 \times 6.12\% = 16.36\%$$

Table 5 - COST OF EQUITY

Risk Free Rate	7.22%
Risk Premium	6.12%
Stock Beta	1.49
Cost of Equity	16.36%

E. Warrant Exercise

Assuming private equity will get an internal rate of return (IRR) of 20%, in year 6, private equity will get warrants worth USD 7.39 billion in 2027.

Table 6 - CALCULATION OF INTERNAL RATE OF RETURN

Year		1	2	3	4	5	6
Description/Period	Unit	2022	2023	2024	2025	2026	2027
Principal	US\$ M	(2,530)	(360)	(290)	(570)	-	-
Interest	US\$ M	-	127	145	159	188	-
Equity Kicker (Warrant)	US\$ M	-	-	-	-	-	7,398
Cash Inflow (Outflow)	US\$ M	(2,530)	(234)	(146)	(411)	188	7,398
IRR		20.00%					

If it is assumed that the total outstanding share of GIAA is 25.89 billion shares, the fair value of GIAA is IDR 10,300 per share, then the fair value of warrants is IDR 8,300 if the private equity exercise price is IDR 2,000. The warrant value of USD 5.93 billion will be divided by the value of the fair value warrant so that private equity will get 12.7 billion shares of GIAA shares.

Table 7 - WARRANTY EXERCISE

Description	Unit	Amount
Total Share Outstanding	Share	25,886,576,254
USD/IDR	IDR	14,250
Fair Value Price 2027F	IDR/Number of Shares	10,300
Exercise Price	IDR/Number of Shares	2,000
Fair Value Warrant	IDR/Number of Shares	8,300
Number of Share	Number of Shares	12,701,212,482

When private equity converts warrants into GIAA shares, the government also converts bonds and shares to get a total of 825.2 million shares. Therefore, after the conversion, GIAA's shareholders will be diluted. The government's share ownership will decrease to 41.85%

from 60.54%, PT Trans Airways' shares in GIAA will be 18.56% from 28.26%, and public shares will be diluted to 7.36% from 11.20%. Finally, private equity will get 32.23% ownership in GIAA

Table 8 - SHARE CONVERSION

Shareholders	Before Conversion		Conversion	After Conversion	
	No. of Shares (Million)	%		No. of Shares (Million)	%
Government	15,671	60.54%	825	16,496	41.85%
PT Trans Airways	7,317	28.26%		7,317	18.56%
Public	2,899	11.20%		2,899	7.36%
Private Equity			12,701	12,701	32.23%
Total	25,887	100.00%	13,526	39,413	100.00%

IV. DISCUSSION

Mezzanine financing is a hybrid financing scheme between debt and equity that can be used by PT Garuda Indonesia (Persero) Tbk to resolve its liquidity problems. The advantage of Mezzanine financing is that the administrative process to obtain financing is relatively easier than senior loans. In addition, the position of mezzanine financing, which is more junior than bank loans, means that PT Garuda Indonesia (Persero) Tbk does not need to provide collateral to the lenders, namely private equity.

Until now, many assets of PT Garuda Indonesia (Persero) have been pledged to banks or other debtors such as receivables, inventory, fixed assets, and even revenue received by PT Garuda Indonesia (Persero) in the future. Even so, there is a fundamental weakness of mezzanine financing, namely the high-interest rate, which is far above senior loans such as bank loans. To overcome this weakness, an option is offered to replace part of the value of the interest into warrants which can then be exercised into shares.

V. CONCLUSION

From the scenarios above, it can be concluded that the high dilution rate is caused by the smaller the value of cash interest provided, the higher the internal rate return expected by Private Equity and the low value of PT Garuda Indonesia's valuation at the time of the exercising warrant.

On the other hand, the dilution rate will be lower if the value of the cash interest given is high, the value of the internal rate return expected by Private Equity, and the higher the valuation value of PT Garuda Indonesia (Persero) Tbk at the time of the exercising warrant. In addition to raising funds from private equity, PT Garuda Indonesia (Persero) Tbk still has to make several efforts to resolve the Company's liquidity problems.

Mezzanines have been widely applied in various countries

by private organizations and state institutions (Sazonov et al., 2016). For instance, the German State Bank spent 800 Million Euros on the ERP-Innovation Program. In France, the OCEO Institute issued 930 million euros for Intangible Expenses, and the Development Bank of Canada gave 500 million euros of Mezzanine to its debtors.

Several things can be done by PT Garuda Indonesia (Persero) Tbk to improve and improve operational and financial performance. Those things are reviewing flight routes, reduction of operational aircraft, negotiating with the government, debt negotiation with Stated Owned Enterprise (SOE) and negotiation related to Lease Payment.

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Paper 48

**Spare Parts Inventory Management : A Classification and
A Forecast Model In Fertilizer Industry**

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Abstract - The agricultural sector is crucial for the growth of Indonesia's economy. The fertilizer company, in particular, is an essential part of the agricultural sector, and needs to manage its spare parts inventory to prevent production failures and minimize the company's plant maintenance expenses. This paper presents a fertilizer company's classification and demand forecasting of spare parts. The classification is conducted using a multi-criteria ABC method with Exponential smoothing weighting, which analyzes the trade-offs between the criticality of spare parts and the total inventory value. On the other hand, demand forecasting is carried out using the Croston forecasting model, Syntetos-Boylan Approximation, and Single exponential smoothing. From the 2024 data analysis, the results of the classification of spare part items show significant changes in categories A, B, and C before and after applying the Multi-criteria ABC method. The results also show that the forecasting using the Single Exponential Smoothing model gives lower error than the other two models. The data used are 10 samples of spare part items with indicator A for the period 2016 to 2021.

Keywords - Spare parts inventory management; Croston model; multi-criteria ABC; Single Exponential Smoothing; Spare parts forecasting; Syntetos-Boylan Approximation

I. INTRODUCTION

The reliability of an industrial equipment will decrease in the long term, which means that as the age of use increases, at a certain point the equipment must be maintained or even replaced [1]. One form of equipment maintenance is to replace damaged equipment so that there is no jamming of the old equipment operation. Downsizing of equipment can result in wasted costs, therefore the supply of spare parts (spare parts) for operating equipment is essential. The number of spare parts in a medium scale engineering business may be in the tens of thousands while in a large scale factory it can reach hundreds of thousands, under these conditions it will be difficult to find the right scale control strategy of each spare part using only humans and therefore inventory management becomes a challenge. large [2]. Control of spare parts inventory is playing an increasingly important role in modern operations management. In spare parts inventory management there are trade-offs, on the one hand too large spare parts provide a large number of services, but on the other hand too little inventory results

in bad customers or very expensive emergency actions that can result in losses to the company. According to [2] operational support and maintenance costs in industrial plants can reach 60% of the total cost with 25%-30% of the costs related to spare parts so that good spare parts inventory management is needed.

To facilitate the management of spare parts, one of the strategies that can be done is to classify these spare parts into a certain category based on similarities in their features and determine their management strategy. One method that is commonly used is the ABC method. The ABC method has traditionally only focused on one criterion, but over time this method has been modified to be able to classify more than one criterion. Multi-criteria ABC is used to classify a number of items with different criteria. The purpose of this paper is to make an additional contribution to the field of spare part inventory management by classifying it using the multi-criteria ABC method with Exponential Smoothing weighting and doing a forecasting comparison of spare part demand using the Croston, Syntetos-Boylan Approximation, and Single Exponential Smoothing methods. Forecasting the demand for spare parts also presents its own challenges, because the demand for spare parts is intermittent. According to Turini and Meissner [3] the demand for spare parts is generally intermittent, infrequent and can indicate no demand at all (the average length of the interval between requests is large).

We conduct a real-word case study using a dataset acquired from one of a large Fertilizer Plant in Indonesia. This industrial sector was chosen because it plays a direct role in increasing the growth of the agricultural sector. The agricultural sector is a sector that plays an important role in economic growth in Indonesia. Based on data from the Central Statistics Agency (BPS) the agricultural sector continues to contribute to the recovery and national economic growth during the COVID-19 pandemic by contributing 1.35% of 66.42% of GDP (Ministry of Agriculture of the Republic of Indonesia, 2021) This paper is expected to contribute by aiding managers in the fertilizer industry to better manage spare parts by taking into account certain criteria.

II. LITERATURE REVIEW

The review of the relevant literature is divided into three main areas. Section 2.1 introduces operations management

and describes maintenance in operations management. Section 2.2 explains the classification of spare parts and the method to be used in our research. In Section 2.3, the forecasting models used in this study are described.

2.1 Operations management

Production is the creation of a good or service, and operations management is a series of activities involved in creating or making a product or service that has added value through changing inputs into outputs [4]. According to the same source, there are 10 strategic operations management decisions, namely: goods and services design, quality management, process strategy, location strategy, layout strategy, human resources, supply chain management, inventory management, scheduling and maintenance [4]. Every manufacturing company carries out the same basic function, namely converting resources into finished goods, and to continue to be able to carry out this function, the company or producer must continue to improve its operational efficiency. One of the decision areas in operations management is maintenance that plays an important part in ensuring that all equipment is always in working order [4]. Maintenance activities require spare parts for replacement of equipment items that have potential to be damaged or failed. The number of spare parts in a manufacturing company may be hundreds or even thousands of units.

2.2 Spare parts classification

According to [5] there are several ways to classify spare part, but the most common method is the traditional ABC for the quantitative method and the VED for the qualitative method. Reference [6] first proposed the ABC classification method based on Pareto's law and divided spare parts items into three categories A, B and C (generally based on the annual dollar usage criteria). Meanwhile, VED method segment the item of spare parts into three segmentation (Vital, Essential, and Desirable) to facilitate analysis and decision making [7]. Reference [8][9] said in their research that the ABC method allows differentiated management of each class. Recent studies have expanded the criteria in the use of this ABC method [10], emphasize the role of lead time criterion in analyzing the competitiveness of companies [11][12] put the criticality as the other criterion. In this paper we use three criteria for spare parts classification, namely, annual dollar usage, number of hits, and average dollar per hits.

2.3 Spare parts demand forecasting

Spare parts forecasting is divided into parametric and non-parametric approaches, where parametric methods are typically rely on bootstrapping procedure that directly evaluates the percentiles of the distribution from data

[3]. Some studies from [13][14][15] have been shown that these methods have advantages in certain situations but they are not well received by practitioners, because they are computationally demanding and increase the complexity of the calculation. The most classic estimation method is exponential smoothing, but then in 1972 Croston demonstrates that this method is biased in the presence of intermittent demand, which is the very common characteristic of spare parts, and he introduces the first estimation method that directly addresses the intermittency of the data [16]. However, the study by Syntetos and Boylan [17] introduced the new estimation method that corrected for the bias in the Croston's method.

III. METHODOLOGY

The object of this research is a fertilizer company in Indonesia. The research methods used in this study are as follows:

3.1 Spare parts classification

The classification of inventory into the A, B, or C categories have generally been based on dollar value per unit multiplied by annual usage rate, commonly known as dollar usage. In this paper, we apply a classification model using the Multi-criteria ABC method with Exponential Smoothing Weights proposed by [18] with the selected criteria as follows:

- o Annual dollar Usage, or the annual fee
- o Number of hits, or the number of items used
- o Average Value per hit, or an overview of the average dollar value for each transaction for an item and the loss incurred in the event of a shortage.

Hence, with the above criteria, calculations are carried out using the following equation:

$$\text{Average value per hit} = \text{Annual dollar usage} / \text{number of hits} \quad (3.1)$$

The results of the calculations were then standardized with the following equation:

$$\text{Standardized Value} = N_{ij} / L_i \quad (3.2)$$

where:

N_{ij} = Item j in criterion i

L_i = Largest value in criterion i

for i = number of criteria, dan j = number of items

after standardization, the next step is the determination of Exponential Smoothing Weights. Determination of exponential smoothing weights is used when decision makers want to assign different weights or values to criteria with the following equation:

$$\text{Weight} = \alpha (1 - \alpha)^{n-1}$$

(3.3)

where: $(0 \leq \alpha \leq 1)$ and $n = \text{number of criteria}$

3.2 Spare part forecasting

One of the basic requirements of spare part management is forecasting of spare part demand. Because of its characteristics, that is very difficult to forecast demand accurately. Forecasting spare parts has a different nature where there is an intermittent/lumpy demand pattern, or it can be called as an intermittent demand pattern, so that the forecasting used is different from forecasting demand for a product in general. In this paper, after the classification, 10 samples with the highest weight or category A will be forecasted. The forecasting models that will be used are Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model, which are the common model used for forecasting intermittent demand.

A. Single Exponential Smoothing

In the Single Exponential Smoothing (SES) method, the first step that must be done is to calculate the initial level with the equation in [19] namely:

$$L_0 = \frac{1}{n} \sum_{i=1}^n D_i \quad (3.4)$$

Where:

L_0 = Initial level

D_i = Demand or demand in period i

The initial level formula is used as the average value of demand over the entire period, and this formula is used at the time of forecasting for the next forecasting, the following formula is used:

$$L_{t+1} = \alpha D_{t+1} + (1 - \alpha)L_t \quad (3.5)$$

Where:

$L_{(t+1)}$ = Level in period $t+1$

α = Smoothing constant (Alpha)

D_t = Demand or demand in period

L_t = Level in period t

B. Croston's method

Croston's forecasting method is divided into two parts, which consist of updated demand (Z_t) and demand interval (P_t). In period t , if there is demand in that period, the demand forecast and the inter-arrival time, namely t , Z_t , and P_t , do not change or the value remains the same as the previous value. If in that period there is a demand then $X_t > 0$, and the forecasting calculation changes to.

$$Z_t = \begin{cases} Z_{t-1}, & \text{if } X_t = 0 \\ \alpha \cdot X_t + (1 - \alpha) \hat{Z}_t, & \text{if } X_t > 0 \end{cases} \quad (3.6)$$

$$q_t = \begin{cases} q_{t-1} + 1, & \text{jika } X_t = 0 \\ 1, & \text{jika } X_t > 0 \end{cases} \quad (3.7)$$

$$P_t = \begin{cases} P_{t-1}, & \text{if } X_t = 0 \\ \alpha \cdot q_{t-1} + (1 - \alpha) \cdot P_{t-1}, & \text{if } X_t > 0 \end{cases} \quad (3.8)$$

From the above equation, an update for the Croston formula is obtained with the following equation:

$$Y_t = \frac{Z_t}{P_t} \quad (3.9)$$

Where:

Y_t = Value of forecasting projection in the next period

Z_t = Forecasting size value based on actual demand data

P_t = Forecasting interval value based on actual demand data

α = Smoothing constant with value $0 < < 1$.

C. Syntetos-Boylan Approximation Method

The Croston's forecasting method shows that there is a bias. And to overcome this, Syntetos and Boylan also provide a new equation to correct the bias by adding a correction factor in the form of $1/2$ and the equation finally turns into the following equation:

$$Y_t = (1 - \frac{\alpha}{2}) \frac{Z_t}{P_t} \quad (3.10)$$

Where:

Y_t = Value of forecasting projection in the next period

Z_t = Forecasting size value based on initial request data

P_t = Forecasting interval value based on actual demand data

α = smoothing constant (Alpha)

The calculations of demand size (Z_t) and demand interval (P_t) follow the equation in the Croston forecast (equation 3.6 – 3.8). For the formula for the first alpha constant, you can use the formula proposed by [20] as follows:

$$\alpha = 2(n+1) \quad (3.11)$$

Where:

α = Smoothing constant (alpha)

n = Number of periods of historical data used for forecasting

D. Forecasting Accuracy

1. Mean Absolute Deviation (MAD)

The first measurement of error is the mean absolute deviation (MAD). This value is calculated by adding up the absolute value of the individual forecasting errors (deviations) and dividing by the number of data periods, as in the following formula [4]:

$$MAD_n = \frac{\sum |A_t - F_t|}{n} \quad (3.12)$$

Where:

- A_t = Actual Request
- F_t = Demand forecast
- n = Number of data periods

2. Mean Square Error (MSE)

Mean squared error (MSE) is a second way to measure the overall forecast error. MSE is the average of the squared differences between the estimated and observed values [4] with the following formula:

$$MSE = \frac{\sum (A_t - F_t)^2}{n} \quad (3.13)$$

Where:

- A_t = Actual Request
- F_t = Demand forecast
- n = Number of data periods

3. Mean Absolute Percent Error (MAPE)

The problem with MAD and MSE is that their value depends on the size of the forecasted item, if the forecast item is measured in thousands, the MAD and MSE value can be very large [4]. To avoid this problem, we can use Mean Absolute Percent Error (MAPE). It is calculated as the average of the absolute difference between the estimated value and the actual value, expressed as a percentage of the actual value, meaning that if we have an estimate and an actual value for n periods, the MAPE is calculated as follows [4]:

$$MAPE = \frac{\sum_{i=1}^n 100 |A_i - F_i| / A_i}{n} \quad (3.14)$$

Where:

- A_t = Actual Request
- F_t = Demand forecast
- n = Number of data periods

selection of the best forecasting method based on its MAD, MSE, and MAPE value. The demand forecasting method with the smallest value is the best method.

IV. FINDINGS AND DISCUSSION

There are 2024 spare part items that will be grouped in this study. These spare part items are movable spare part items or there is at least one transaction within a period of five years. Furthermore, the 2024 spare part items are classified using the multi-criteria ABC method based on the weights calculated using the Exponential Smoothing weighting equation. The spare parts items that have an accumulated weight of 70% of the overall weight fall into category A, and spare parts items which has an accumulated weight of 20% of the overall weight is in category B, and finally spare parts items that have

an accumulated weight of 10% of the total weight are included in category C. The comparisons of classification between before and after the application is presented in Table I.

Table 1 - Number of Spare Part Items in Each Category Before and After Classification using the Multi-criteria ABC method

ABC Indicator	Before	After
A	1024	147
B	528	486
C	23	1391

Forecasting in this study aims to see the demand for spare parts items with indicator A. We compare three methods to find the best forecasting method for this case. The data used for forecasting is the historical data on demand/use of spare parts in the period 2016 to 2021, with a smoothing constant or of 0.3 for each forecasting model.

The Single Exponential Smoothing method is used to forecast spare parts items because this method is good for use on demand that does not have a trend or seasonality [19]. In forecasting using the Single Exponential Smoothing method, the forecasting results tend to follow the pattern of actual demand. In forecasting using the Croston method, the forecasting calculation is divided into two parts, namely the part with a zero value and a non-zero value.

The Croston forecasting method gives results that are much different from forecasting with the previous Single Exponential Smoothing model. In this forecasting model, it appears that the forecasting results show a tendency for horizontal demand patterns where the forecasting results fluctuate around the average value. The Croston's model is a forecasting model adapted from the Single Exponential Smoothing forecasting model, but in Croston's model the projection for data with a zero value follows the previous projection data and updates the calculation when the data is no longer zero. However, in this study, it is shown that the demand forecasting pattern of the Single Exponential Smoothing and Croston models are very different.

The Syntetos-Boylan Approximation forecasting model is the result of a modified Croston's forecasting model, where this model reduces bias by adding a correction. Forecasting generated from the Syntetos-Boylan Approximation model is similar to the projections of the Croston model (see Figures 1 to 10).

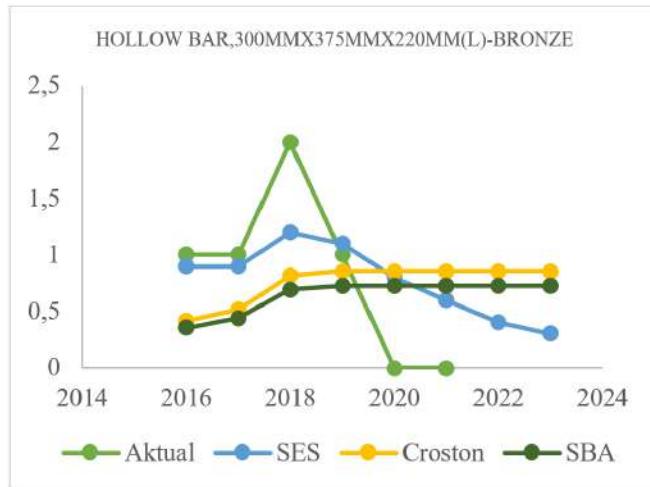


Fig. 1. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston model, and Syntetos-Boylan Approximation model on HOLLOW BAR, 300MMX375MMX220MM (L)-BRONZE.

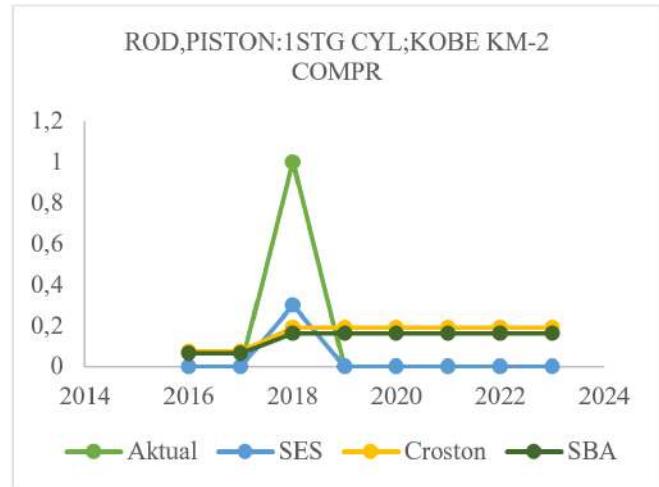


Fig. 4. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's, and Syntetos-Boylan Approximation model on ROD,PISTON:1STG CYL;KOBE KM-2 COMPR

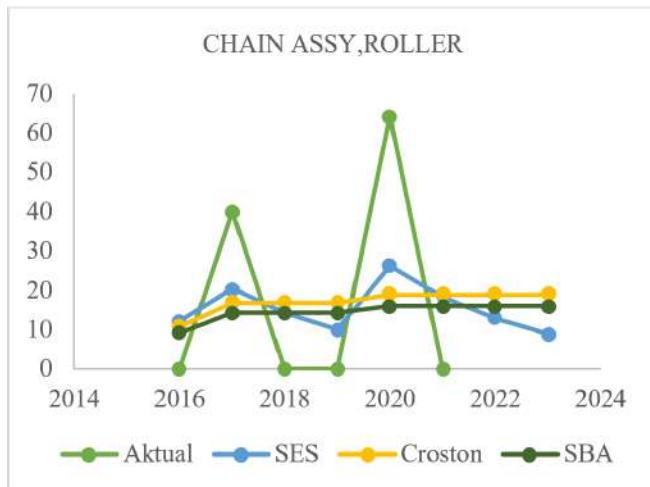


Fig. 2. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston model, and Syntetos-Boylan Approximation model on CHAIN ASSY,ROLLER

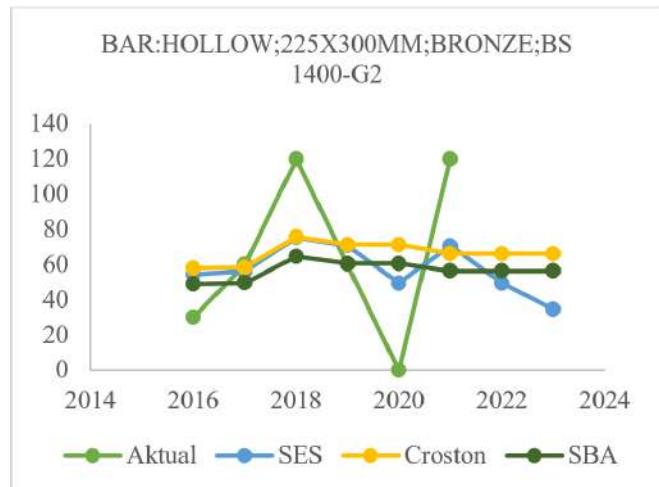


Fig. 5. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on BAR: HOLLOW;225X300MM; BRONZE; BS 1400-G2

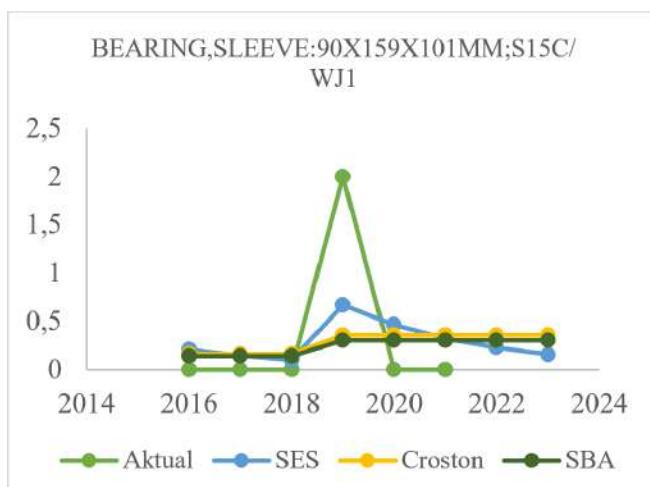


Fig. 3. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on BEARING, SLEEVE: 90X159X101MM;S15C/WJ1

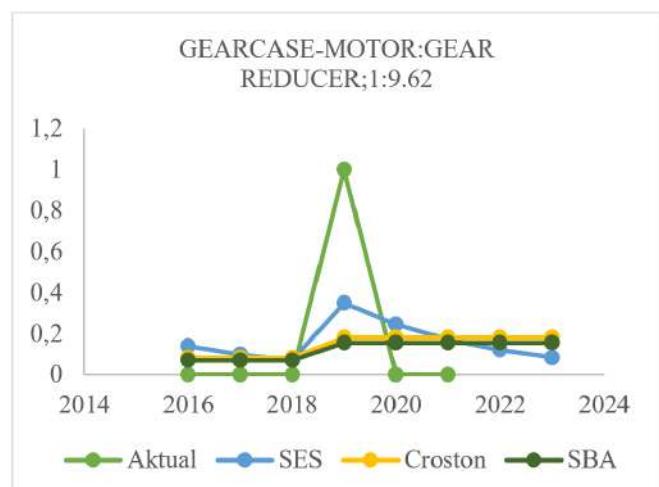


Fig. 6. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on GEARCASE-MOTOR: GEAR REDUCER. 1:9.62

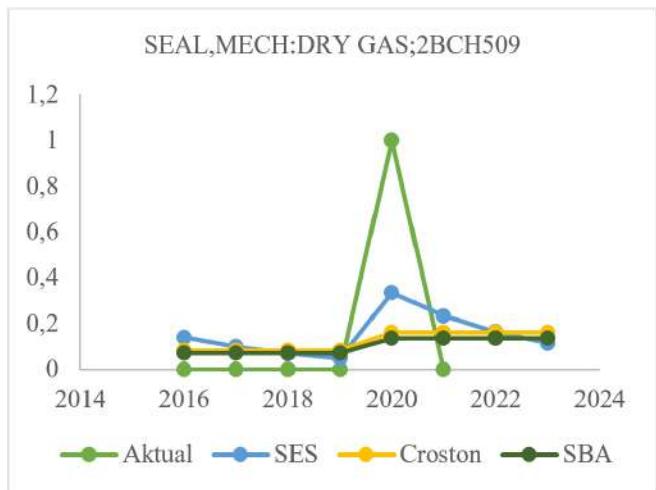


Fig. 7. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on SEAL,MECH: DRY GAS; 2BCH509

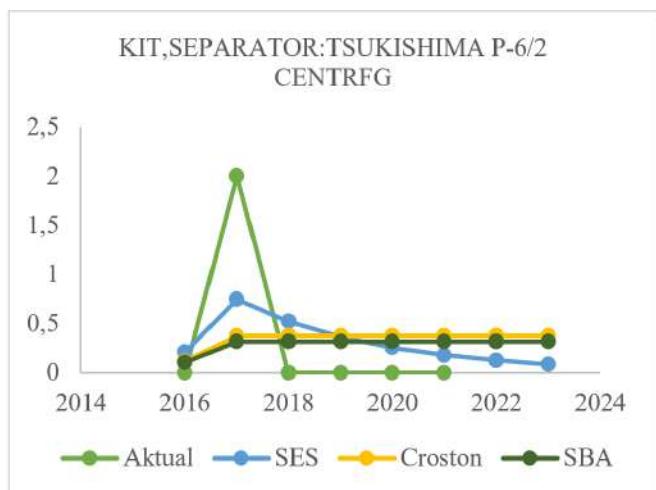


Fig. 8. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on KIT,SEPARATOR: TSUKISHIMA P-6/2 CENTRFG

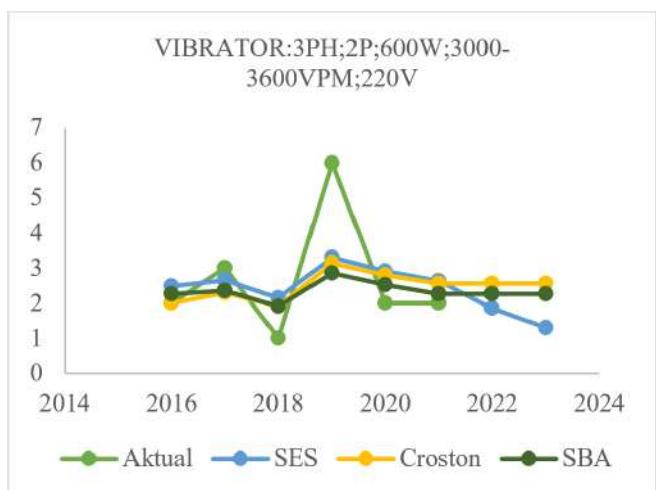


Fig. 9. Comparisons of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on VIBRATOR: 3PH; 2P; 600W; 3000-3600 VPM; 220V



Fig. 10. Comparison of actual demand and forecasting results using the Single Exponential Smoothing model, Croston's model, and Syntetos-Boylan Approximation model on RING,PISTON:KOBE KM-2 COMPR

Table II presents the comparison results of the accuracy of three forecasting models. It can be seen that the forecasting model that gives the smallest MAD and MSE value is Single Exponential Smoothing model, followed by the Syntetos-Boylan Approximation model, and finally the Croston's model. For the MAPE value Croston's model give the smallest value followed by Single Exponential Smoothing model, and the Syntetos-Boylan Approximation model.

V. CONCLUSION

ABC classification method is the most commonly used method in spare parts inventory management. The multi-criteria ABC method with exponential smoothing weighting provides convenience in application in the real world and still provides significant values on criteria that are considered important as a classification reference. research on [21] [22] also uses the multi-criteria ABC method as the basic method of classification. they also combine it with several other classification models. Not always items with high prices are on indicator "A", and conversely, not all items with low prices are on indicator "C". with more criteria taken into account will provide a better assessment for the placement of categories of each spare parts item.

In forecasting the spare part items, the single exponential smoothing model gives the best forecasting results because the error value of this forecasting result is smaller than the other two models. research on [23][24] demand data patterns that do not show any indication of seasonality or trend using the Single Exponential Smoothing forecasting model

This study is not without limitations, the use of criteria in this study is still very limited to only three criteria. for further research, to provide the right classification, other criteria can be added, such as obsolescence, lead time,

and others. Another limitation of this study is the use of data that is limited to six periods. Further research can add the period used in order to get a more accurate forecast.

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Table 2 - MSE-Based Forecasting Accuracy Calculation Results

Material Number	Material Description	MAD			MSE			MAPE		
		SES	CROSTON	SBA	SES	CROSTON	SBA	SES	CROSTON	SBA
6141040	HOLLOW BAR,300MMX375MMX220MM(L)-BRONZE	0,42	0,73	0,71	0,28	0,62	0,58	11,67	22,46	26,59
6142491	BEARING,SLEEVE:90X159X101MM;S15C/WJ1	0,43	0,45	0,42	0,36	0,41	0,41	11,07	10,24	10,58
6136261	CHAIN ASSY.ROLLER	18,69	21,17	19,94	432,99	540,34	527,94	17,97	16,06	17,40
6139710	ROD,PISTON:1STG CYL:KOBE KM-2 COMPR	0,12	0,24	0,22	0,08	0,11	0,11	11,67	10,11	10,46
6140778	GEARCASE-MOTOR:GEAR REDUCER:1:9.62	0,23	0,22	0,21	0,09	0,10	0,10	10,87	10,24	10,58
6137072	SEAL,MECH:DRY GAS:2BCH509	0,21	0,21	0,19	0,09	0,10	0,10	11,11	10,50	10,80
6143106	KIT,SEPARATOR:TSUKISHIMA P-6/2 CENTRFG	0,46	0,50	0,46	0,35	0,44	0,43	10,44	10,16	10,51
6134883	BAR:HOLLOW;225X300MM:BRONZE;BS 1400-G2	30,43	42,78	40,30	1268,86	2448,52	2202,72	30,72	24,46	22,67
6146408	VIBRATOR:3PH;2P;600W;3000-3600VPM;220V	1,04	1,37	1,28	1,70	2,94	2,72	32,72	28,71	27,06
6138950	RING,PISTON:KOBE KM-2 COMPR	2,48	3,25	3,04	8,93	13,41	12,68	11,43	13,90	15,57
Average		5,452	7,091	6,679	171,373	300,698	274,780	15,966	15,682	16,220

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USAHA MIKRO KECIL MENENGAH



Paper 49

The Impact of External Pressures on the Eco-Innovation Adoption of Micro, Small, and Medium Enterprise (MSME) in Indonesia

Melati Kemas Sudirman

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The 7th International Conference on Management in Emerging Markets

Abstract - The concept of eco-innovation has been recognized as a robust mechanism for sustainable business innovation models of micro, small, and medium enterprises (MSME). However, less attention has been paid to the application of eco-innovation to MSME performance, although MSMEs may benefit more from eco-innovation practices than larger firms. This creates an innovation gap between MSMEs and large companies. This paper attempts to fill this gap by examining the impact of external pressures on the adoption of eco-innovation in MSMEs and its impact on the performance and competitiveness of company products. Quantitative data analysis is used in this research as the objective is to gain an in-depth understanding of the impact of eco-innovation on the performance of MSMEs in the manufacturing sector. The respondents in this research are Indonesian citizens and business owners in the fashion industry. This study uses a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach to assess and estimate correlations between variables. The results show that the eco-innovation practices in the company is influenced by external pressures. This paper uses institutional theory to explain the drivers of eco-innovation adoption in Indonesia. The paper concludes that coercive pressures and mimetic pressures have a significant and positive impact on the adoption of eco-innovation. The study of the fashion industry can be a potential opportunity to deepen discussions with different types of eco-innovation that require a holistic view and company capabilities.

Keywords - Fashion industries, Eco-innovation, Green company, MSMEs performance

I. INTRODUCTION

Companies are looking for collaboration in today's competitive environment, realizing that they cannot just rely on internal capabilities and resources to innovate [1]. combine internal and external resources to accelerate internal innovation and expand the market for the use of external innovations [2]. Asian countries are making various efforts to encourage technological innovation to remain competitive. However, according to the 2014 Global Innovation Index (GII), Indonesia's level of innovation is still lagging behind neighboring countries such as Singapore, Malaysia, Thailand and Vietnam, which ranked 87th out of 143 countries. The concept of eco-innovation has not yet been fully adopted, and the level of innovation

practice lags behind other countries. The concept of eco-innovation is mainly used by large companies whereas eco-innovation requires a holistic approach for the functioning of micro, small, and medium-sized enterprises (MSMEs). MSMEs also benefit from flexible, bureaucratic and better customer relations features that can respond quickly to market and technological changes. However, experts point out that external factors, such as coercive pressure, normative pressure, and mimetic pressure can affect the promotion of eco-innovation by MSMEs, leading to a gap in innovation between MSMEs and large enterprises.

The concept of eco-innovation has been adopted as a transformational innovation in which the innovation process is transformed into innovative practices focused on the environment and sustainability. Companies are under pressure to respond to these demands and remain sustainable [3]. Thus, companies are giving attention to social and environmental considerations in their decision-making. The result of the adoption and implementation of eco-innovation is the improvement of environmental protection capacity and business efficiency. In developing countries, the concept of eco-innovation is in the initial stage, which means that more attention and understanding of sustainability practices are needed, along with external support. This paper aims to promote the adoption of eco-innovation practices. By understanding the institutional drivers of eco-innovation adoption, policymakers can create an environment conducive to increased adoption of eco-innovation by businesses, especially Indonesian MSMEs. The main objective of this study is to investigate the impact of different institutional pressures on the adoption of eco-innovation. In particular, this study is focusing on defining the relationship between innovation and Indonesian MSMEs and how MSMEs engage in eco-innovation practices to reduce the innovation gap between MSMEs and large enterprises. The data were collected through a questionnaire-based survey of the Indonesian manufacturing industry. Therefore, the hypothesis is designed as follows. For a more complete explanation, Figure 1.0 presents a conceptual model and a hypothesis of the paper.

Hypothesis 1. Coercive pressures have a positive impact on MSME adoption of eco-innovation.

Hypothesis 2. Normative pressures have a positive impact on MSME adoption of eco-innovation.

Hypothesis 3. Mimetic pressures have a positive impact on MSME adoption of eco-innovation.

The research conceptual model draws from external pressures received by the company. This research express potential coercive pressure, normative pressure, and mimetic pressure as independent variables having an effect on the adoption of eco-innovation as dependent variable. Fig. 1 presents a research conceptual framework and hypothesis of the paper.

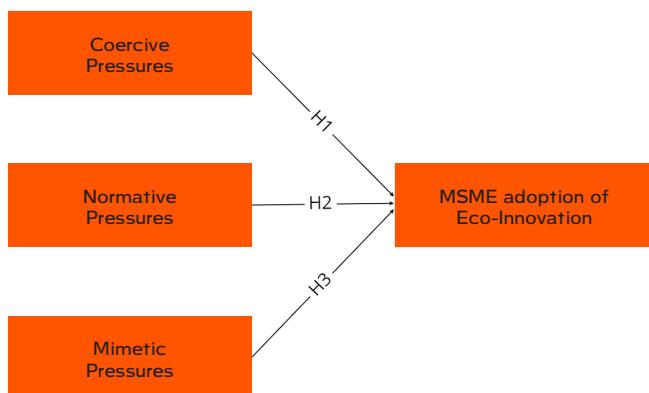


Fig. 1 Conceptual Framework

II. METHODOLOGY

This research uses a quantitative method using a survey. The population in this study are small business owners in Indonesia. The owners of the MSMEs have been classified according to the manufacturing sector, specifically the fashion industry. The manufacturing sector contributes greatly to the Indonesian economy through the value of exports, which supports GDP growth in Indonesia. However, this sector is the second largest polluter in the world. High production levels can have significant social and environmental impacts on the supply chain. Therefore, this study aims to examine the institutional pressures faced by companies in adopting environmental practices in Indonesia. The study model is tested using the statistical application of the Smart PLS software (v3.3.2) to calculate and analyze the sample size based on regression, path and principal component and to generate standardized regressions of the structural model paths in addition to the factor loading of the measurement elements. The items measured consist of external factors affecting the implementation of eco-innovation by Indonesian MSMEs.

The external factors consist of 10 indicators and are presented as independent variables. There is pressure from external stakeholders such as government agencies and non-governmental organizations to compel companies to implement various environmental regulations and standards. Normative pressures come from suppliers, customers, associations (e.g. trade unions), media and other social entities. Mimetic pressure occurs

when companies compete for superior performance. The introduction of eco-innovation can reduce the burden on the environment and improve the environmental image of a company. The adoption of eco-innovation measures a company's ability to adapt production processes that take into account the long-term impact on the environment. Innovation is related to the discovery and use of technology so that companies can use their resources to protect the environment from pollution and dangerous substances. This provides a competitive advantage that makes it easier for businesses to survive in the market. Table 1.0 shows the operationalization of the constructs.

III. RESULTS

The calculations indicated that the minimum requirement should exceed 110 and, as a result, 225 respondents were selected for reliability and validity testing [4]. The questionnaire consisted of 28 questions, consisting of 5 questions on the respondent's profile and 23 statements assessing the respondent's agreement, rated on a 5-point Likert scale, with 1 strong disagreement and 5 strong agreement. The questionnaire contains several statements that measure the factors by which companies adopt eco-innovation practices. The questionnaire was developed using a conceptual framework adopted from previous studies [5].

The 314 respondents were selected and processed to determine the strength of correlation between variables. The demographic sample size shows that 99.4% of the respondents own MSMEs in Indonesia and 95.2% (or 297) of them are MSMEs in the fashion industry. Most of them, 80.8%, is less than or equal to five years old. 85.2% of the respondents have a turnover lower than or equal to IDR 2,500,000,000 per year. Of the 297 respondents, data cleaning was carried out so that 225 respondents were obtained for further reliability and validity testing. The validity of a model may be assessed by evaluating the construct and the indicator (reliability) as well as whether it is convergent and discriminatory (validity). Several indicators such as CP4, EI2, EI5, EI6, and EI7 should be eliminated due to low outer loadings. Although there is one loading value around 0.5 and four around 0.6, but the construction reliability is greater than 0.7 and Cronbach's alpha is greater than 0.5. Furthermore, the AVE value is higher than 0.5. This suggests that the indicators and construct used in this study are likely to produce consistent results. Table 1 presents the results of the validity and reliability analysis. Table 1 presents the results of validity and reliability analysis.

Table 1 - Validity and Reliability Analysis

Items	CA	CR	AVE
Coercive Pressure	0.571	0.777	0.539
Normative Pressure	0.531	0.758	0.514
Mimetic Pressure	0.672	0.798	0.501
Eco-Innovation	0.515	0.755	0.508

R-square is a statistical parameter in a regression model that indicates how well the variation on the dependent variable can be explained. An R-squared value less than 0.5 is often used to predict human behavior because it is inherently difficult to predict. The R square value of the data in this study was greater than 25%, or 0.25 indicating that the effectiveness of the data fit the regression model is moderate. In addition, the inner VIF values between the path relationships have been presented in Table 2. Therefore, the collinearity of the structural model has to be examined. With the proposed VIF value <3, there is a strong claim that the study has no multicollinearity problems, while numbers greater than 5 indicate the potential for collinearity between predictor constructs. Table 2 shows the results of the hypothesis test.

Table 2 - Validity and Reliability Analysis

Hypothesis	SD	p-value	t-value	Result
H1: Coercive Pressure → Eco-Innovation	0.093	0.002	3.156	Supported
H2: Normative Pressure → Eco-Innovation	0.087	0.100	1.650	Not Supported
H3: Mimetic Pressure → Eco-Innovation	0.080	0.012	2.525	Supported

The H1 hypothesis was supported to confirm the positive and significant effect of coercive pressure on MSMEs to adopt eco-innovation. There is a significant relationship between coercive pressure and the adoption of eco-innovation. As the p-value is less than 0.01, it indicates that pressure from government or stakeholder policy pressure is affecting innovation in Indonesian MSMEs. This conclusion was reached when the authors argued that stakeholder pressure in organizations such as customers, government agencies, regulatory standards, policies, and non-governmental organizations was essential for the successful adoption and implementation of eco-innovation [6]. Schmitz also noted that adopting a proactive environmental strategy largely depends on pressure from various stakeholders, especially organizational and regulatory stakeholders [7]. Therefore, strengthen support for H1. The scale for measuring coercive pressure has been divided into five indicators. The CP2A indicator helps decision-makers propose ways to reduce the demand for resources. As a result, 94.04% of respondents agree that policymakers should strive to reduce resource demand by repairing or upgrading products rather than buying new

products and stimulating the economy. change. However, the remaining 5.96% disagree with this statement. These results indicate that people with full authority or power in Indonesia focus on organic production and sustainability. Indicators marked with the symbol CP4, indicating regulatory and policy support for clean manufacturing, had to be eliminated due to their low confidence scores. Following a previous study on external and internal factors that can influence the adoption of clean manufacturing [8], this study extends the empirical evidence and conceptual analysis of manufacturing to include eco-innovation concepts in clean technologies. Based on these results, the concept of modifying the production process to reduce environmental impact takes on more meaning. Therefore, it can be concluded that coercive pressure has a positive impact on the introduction of eco-innovation by MSMEs.

Unlike hypothesis H1, hypothesis H2, which aims to confirm the positive and significant effect of normative pressure on the adoption of eco-innovation by MSMEs was not supported. The results show that Indonesian MSMEs are starting to develop eco-innovation practices and achieve their sustainable goals. However, existing laws or regulations in the region have not led to the adoption and implementation of environmental innovations. Although companies are starting to develop eco-innovation, the motivation is still based on standards rather than sustainable goals. As normative pressures are tied to issues of legitimacy, organizations tend to engage themselves with other organizations and act according to the standards or norms that apply to their institutional sector. In developing countries, normative pressure is seen as a driving force influencing norms and responsibility, because it affects socially acceptable behavior. In other words, the normative pressures leading to eco-innovation have influenced the sense of responsibility that creates social acceptance and leads to sustainable lifestyles. Moreover, additional training is needed for other entities in the business world that promote normative pressures, such as suppliers, customers, trade unions, media, and other social structures related to sustainability, to improve eco-innovation practices.

The normative pressure measurement scale is divided into four indicators. The NP4A indicator represents the emerging environmental education programs in Indonesia. The results show that 98.62% of respondents agree that the increase in environmental education programs has increased public interest in the value of nature. However, the remaining 1.38% disagree with the statement. These results mean that environmental and social education programs are accepted by society and that awareness of the value of nature has increased. Hypothesis H3 was supported by the positive and significant effects of mimetic pressure on eco-innovation adoption. There is

a significant correlation between mimetic pressure and acceptance of eco-innovation. It shows that competitive pressure hampers innovation of Indonesian MSMEs. Mimetic pressures arise when companies compete for superior performance. To be market leaders, MSMEs continue to innovate and invest in eco-innovation. The flexible nature of MSMEs facilitates adaptation to market and demand. In developing countries, mimetic pressure promotes better environmental management for foreign and multinational organizations. Strong mimetic pressures affect governments and interest groups, forcing corporations to adopt advanced environmental management and technologies as subsidiaries of multinational corporations, making them redundant in local organizations. Therefore, it can be concluded that mimetic pressure has a positive impact on the acceptance of eco-innovations by MSMEs.

From the data analysis obtained, Fig. 2 presents the structural model.

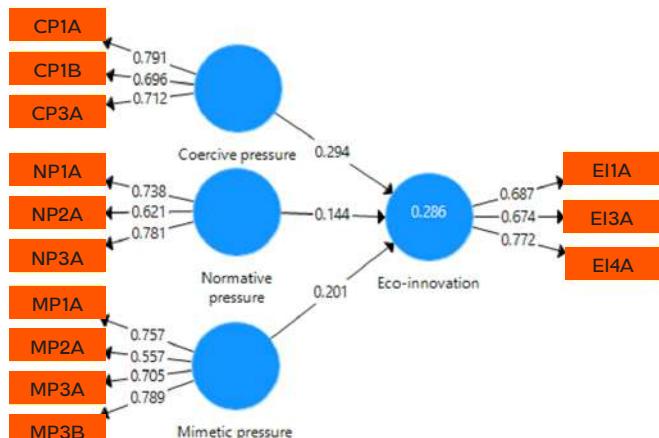


Fig. 2 Structural Model

IV. DISCUSSION

Based on the data analysis, this paper concludes that coercive pressure and mimetic pressure have a positive and significant effect on eco-innovation practices. These results indicate that companies under coercive and mimetic pressures are more likely to adopt eco-innovation in order to gain legitimacy and maintain better relationships with stakeholders. However, normative pressures do not support green innovation practices in Indonesia. This result shows that the adoption of eco-innovation is attractive and can be beneficial for many companies, but the Indonesian experience is still in its infancy as many do not know how to implement eco-innovation effectively and there are only a limited number of companies who have successfully implemented eco-innovation. The companies that received high institutional pressures are more likely to implement eco-innovation. This allows them to conform to coercive and mimetic pressures to maintain good relationships with stakeholders to obtain legitimacy

and reputation. Otherwise, companies would be punished by governments, isolated from stakeholders, and deprived of external resources and market share [9], [10]. Therefore, the higher the rate of adoption of eco-innovation by companies, the lower the impact of regulatory pressures. In other words, the positive effect of institutional pressure depends on the level of implementation of eco-innovation.

Based on the general results and the analysis of this study, two conclusions were drawn. First of all, eco-innovation is an important aspect to ensure a competitive advantage. Eco-innovation arises from the concept of open innovation, which is undergoing a social change. The concept implements ecological production processes as a result of the combination of internal and external resources of the company. This research helps determine the factors that influence a company's innovation potential. It also analyzes the level of institutional pressures on companies and influences the adoption of eco-innovation by companies. Second, the late introduction of eco-innovations compared to other countries can be explained by the still nascent level of implementation. In other words, the concept of eco-innovation has not yet been fully embraced by Indonesian MSMEs. The implementation of eco-innovation method has the potential for the development of Indonesian MSMEs. Therefore, additional training is needed to introduce the concept of eco-innovation and increase understanding among members.

V. CONCLUSION

The concept of eco-innovation is an effective means of overcoming the positive impact on the environment and reducing the negative impact of environmental practices [11]. In this study, it was found that coercive and mimetic pressures were found to drive the adoption of eco-innovation. The pressure that MSMEs receive from the external entity creates a positive environmental effect via resource saving [12]. As indicated by Hermosilla et al. that eco-innovation leads to less waste, less pollution, and less resource use [13]. On the other hand, normative pressures have a negative relationship with eco-innovation adoption. The negative relationships indicate that not all capabilities support companies that lead to eco-innovation. This is due to the lack of information received about the practice of innovation itself or the available resources are still limited so MSMEs take other alternatives to increasing company innovation. The findings further show that the organization is relationship-oriented and responds to various forms of pressure to maintain good relations with stakeholders and to pursue social legitimacy [14]. This paper shows that institutional pressures support concrete interpretations of eco-innovation practices. The study findings offer a number of implications for practitioners and policy makers. The role of institutions should be strengthened to promote environmental innovation and encourage

organizational activities to improve environmental performance. Institutional pressure encourages an organization's standards, beliefs, and culture to promote an eco-friendly climate while encouraging the adoption of environmentally friendly practices. Institutional pressure also helps organizations to implement environmental management [15].

This research has a number of limitations. First, the survey concerns MSMEs with few employees in the Indonesian fashion sector. Second, the survey was conducted online with a limited number of MSME owner respondents as key informants. Third, this survey was conducted for a limited period from December 2021 to July 2022. Besides all the limitations of this study, it is important to recognize that the results will depend on the criteria used in this study and that there may be other eco-innovation factors that were not considered in this study. Furthermore, data collection is based on causal relationships between independent and dependent variables. Therefore, it may not be the proposed general model proposed, as external pressures may reflect mixed motivations. This model provides different results in different sectors and countries. As a suggestion for future research, by exploring the conceptual model it is possible to understand the main characteristics, similarities, and differences of companies introducing the concept of eco-innovation. In addition, the conceptual model can also be combined with internal resources with pressure received to provide a different perspective on the use of this eco-innovation concept.

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Paper 50

Reduce Unplanned Shutdown on Surface Facilities of Oil and Gas Plant Process

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ICMEM

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Abstract - The purpose of this study is to assess the impact of equipment condition monitoring and asset management based on historical data management on reducing unplanned shutdowns and improving plant reliability to meet company expectations and maintain the safety of upstream oil and gas business installations. The scope of research is limited to the application of condition monitoring analysis methods, big data management and the concept of operation on turbomachinery in surface facilities in maintenance activities in upstream oil and gas business.

The research approach is carried out quantitatively and qualitatively. The quantitative approach uses references to experience in employment in the field of maintenance of surface facilities, the use of turbomachinery equipment operating data including organizational and human capital influence in upstream oil and gas industries. The utilization of library reviews on Statistical Quality Control is used to facilitate the realization of the purpose of this research.

Condition monitoring is an innovation in the field of equipment maintenance and is the basis for the formation of predictive maintenance methods. The study is to ensure that big data analysis is the main capital to reduce unplanned plant shutdown in the oil and gas industry.

Keywords - Oil and Gas shortfall, Surface Facilities, Preventive Maintenance, Predictive Maintenance, CMIMS (Computerized Maintenance Inspection Management System), Unplanned shutdown, Turbo-compressor, Obsolescence, spare parts, Availability, Reliability, Artificial Intelligent, Statistical Quality Control, Six Sigma, innovation and design thinking, Knowledge Management

I. INTRODUCTION

Along with the maturity of oil and gas producing wells in Indonesia, the unplanned shutdown of well production must be minimized as much as possible. The unplanned shutdown or unexpected equipment breakdown in oil and gas production has the potential to result in a temporary decline in production (until the well can be reproduced after a malfunction or failure mode can be overcome), or a continuous / permanent production loss due to sensitive well conditions.

The current oil and gas balance, especially in Indonesia, has a deficit and is getting wider every year. The oil balance deficit can be seen in chart 1 illustrates that the oil deficit was triggered by an increase in oil demand by 5.2% to 1.65 million barrels per day followed by a decrease in oil production by 3.5% to 805 thousand barrels per day.

This then encourages upstream oil and gas companies to always innovate to find efficient and effective ways to control failure modes that may arise so that unplanned shutdown events can be minimized

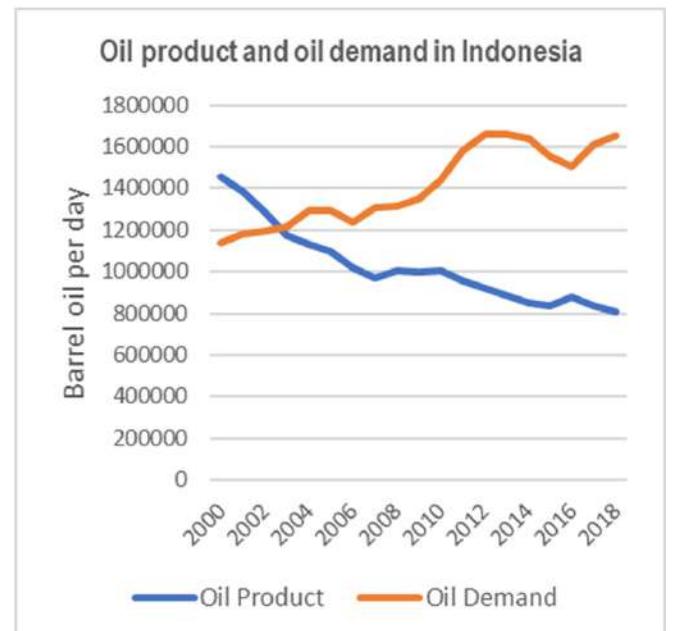


Chart 1: Deficit oil balance Indonesia (source: <https://databoks.katadata.co.id>)

The unplanned shutdown event could be caused by automatic shutdown system and manual shutdown (involving manual intervention) to protect assets against an event that has the potential to endanger the safety of oil and gas installation operations. Plant shutdown automatically occur because of the presence of safety devices to protect the operations of oil and gas processing plant with the right level of safety, such as fire and gas detectors, pressure/temperature/level safety devices, vibration sensors, and others. Unplanned shutdown events can also be caused by failures in production equipment including other causes that are not related to operations equipment.

A. Definition and Classification

Clarity of definition differences between unplanned shutdown and planned shutdown must be done first so that the control of failure modes can be carried out in a targeted manner.

For oil and gas companies in Indonesia, the definition of unplanned shutdown refers to PTK-041 SKK Migas as follows: Unplanned shutdown is the unplanned (uncontrolled) or unexpected partial or complete termination of production facilities due to equipment failure and abnormal operating conditions. The definition of Planned Shutdown is the temporary suspension of part of oil and gas production facilities in a planned and controlled manner to carry out scheduled activities such as maintenance and others.

The classification of each unplanned shutdown event is to maintain accuracy in the search for root cause and prioritize in solving problems quickly. Based on observations and work experience in an oil and gas company in Indonesia, the classification of unplanned shutdowns globally is illustrated in figure 1.

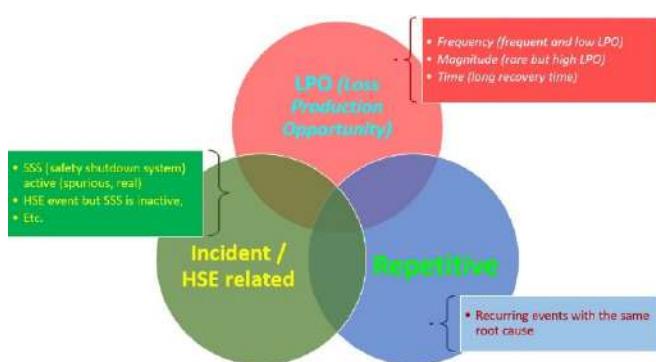


Figure 1: Setting Priorities in Handling Unplanned Shutdowns

Based on quantitative research, it consists of six practical ways to manage the classification of unplanned events in an upstream oil and gas company in Indonesia as follows: Monitoring settlement steps in each case of unplanned shutdown by related entities, Setting a priority scale on solving unplanned shutdown problems, Identifying bad actors for continuous improvement, Root cause analysis (RCA) of the occurrence of unplanned shutdown problems, Establishing initiatives and updated ways to prevent repeated events due to the same root cause in the future, Documentation of problems for historical data purposes as lesson learnt

B. Purpose of Study

Qualitatively, this study intends to prove a statistical quality control algorithm whether the algorithm can be used to process data from condition monitoring as an

alternative predictive analysis tool. Proof of the use of the algorithm will be carried out by processing data running on turbomachinery equipment.

In addition, quantitatively this study also aims to examine what factors can contribute to reducing unplanned shutdowns and surviving, and even increasing equipment reliability.

This research will provide benefits to the upstream oil and gas industry. This research will contribute and increase insights to reduce unplanned shutdowns, especially in the surface facility team, maintenance, inspection and field management team. For example, understanding the importance of condition monitoring, big data management and analysis, as well as predictive analysis, oil & gas industry professionals, who handle operation surface facilities can develop policies, strategies, initiatives, and innovations to improve the ability to predict changes and respond quickly and appropriately while optimizing the use of existing facilities and manpower and optimizing operating costs.

C. Review of Surface Facilities Maintenance Strategy in upstream Oil and Gas Industry

Maintenance is a system for maintaining, monitoring, managing findings, analyzing, failure prevention-prediction, repairs, and also to modify any equipment and systems available in the company area to ensure that the physical asset continues to do whatever its users want it to do in the context of its current operation and is always in an acceptable condition to operate according to the envelope design that complies with safety and environmental standards or regulations. Maintenance strategies can be categorized into two strategies, which are proactive maintenance and reactive maintenance.

The strategy to achieve maintenance objectives starts from the project phase (design / engineering, construction, commissioning and start-up), during the operational phase and up to the mothballing / decommissioning phase. It became very clear that the maintenance strategy should be set up as early phase as possible of the facility development phase to avoid difficulties during the operational phase.

II. LITERATURE REVIEW

A. Nature of Condition Monitoring

Condition monitoring is an activity to collect, monitor and analyze the overall performance of the facilities and periodically to predict abnormal conditions during operation using certain techniques (such as vibration analysis, lubrication analysis, working temperature

analysis, efficiency analysis, measurement technic, etc.) Preference is given to non-intrusive techniques (ultrasound, infrared thermographs, acoustics, laser-tools alignment, etc.) because of production constraint and exposure to hazards (toxic substances, electricity, etc.).

The results of the condition monitoring analysis are used to intervene in Condition-Based Maintenance to avoid any surprises (breakdowns), to reduce reactive maintenance, to optimize Predictive Maintenance activities and also to improve the quality of Preventive Maintenance.

B. Proactive and Reactive Maintenance

Proactive maintenance is failure-finding activities to find and detect hidden failure modes as much as possible, by using the appropriate technology, involves a plan-do-study-act (PDSA) cycle to emphasize learning and improvement with the main goal is to avoid repetitive failures. Proactive maintenance consists of preventive maintenance (PM) predictive Maintenance (PdM) and condition-based maintenance (CBM). Preventive maintenance (PM) is time-based maintenance which is carried out based on the operating time limit given by the OEM (Original Equipment Manufacturer). Assets or equipment must be shut down and disassembling is required on the equipment to carry out the PM program. The results of the PM are recorded and used as a reference to make decisions on the need for further maintenance. Predictive maintenance (PdM) is data-based maintenance, which is an activity of identifying data, data trends and predicting when a failure will occur. This method collects and analyzes real-time data on equipment performance, where this process is carried out when the equipment is operating normally. Condition based maintenance (CBM) is a maintenance activity with good planning, be it in the form of repair, replace or restore as a follow-up to the results of condition monitoring of PM and PdM activities. Proactive maintenance is carried out to extend the operating time of an asset, prevent unexpected breakdowns, and costs saving purposes.

The reactive maintenance strategy is failure-based maintenance as illustrated on figure 2. Reactive maintenance is a maintenance activity (repair, replace, restore) to overcome emergency problems and reduce negative effects on the consequences of failure of the asset or equipment. These failures occur because failure mode could not be or unable to be captured by proactive maintenance activities. Thus, the occurrence of reactive maintenance activities must be reduced.

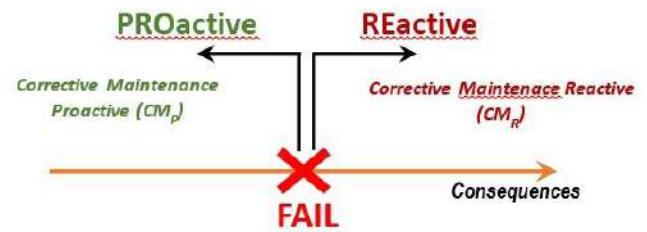


Figure 2: Illustration of proactive and reactive maintenance against failure events

C. Role of Turbomachinery in Upstream Surface Facilities Oil & Gas Industry.

According to the criticality assessment of equipment in upstream oil and gas production, it consists of 3 classifications of equipment, which are vital, important and secondary equipment. Vital equipment is equipment the failure of which immediately causes a loss of production, decreases the level of safety and affect the environment. Important equipment or critical equipment, is equipment the failure of which increases the risk of production loss, might affect the environment or is necessary of health and general welfare of personnel. Secondary equipment is equipment the failure of does not affect production, safety or environment.

Turbomachinery is an engine that deals with the transfer of energy between fluids (liquids & gases) and rotors (rotating shafts). Based on the OREDA Offshore and Onshore Reliability Data Handbook, in machinery system there are 6 classes of equipment, which are compressors, gas turbines, pumps, combustion engines, turboexpanders and steam turbines.

Turbomachinery in the upstream oil and gas industry holds an important role in ensuring the running of the production process at the oil and gas plant. In this study, it is limited to study how to reduce unplanned shutdown in turbo-compressors (centrifugal gas compressor driven by gas turbine) and turbo-generators (electrical generator driven by gas turbine). Gas compressors are the main equipment to export gas products to the customers. The turbo-generator is the main power generation equipment to provide electrical energy so that the production process can operate as it should be. Based on its operational function, turbomachinery is categorized as vital equipment or important equipment.

III. REDUCE UNPLANNED SHUTDOWN IN UPSTREAM OIL AND GAS INDSTRY

A. The decline in production and the increasing demand for oil and gas urge every upstream oil and gas companies to take initiatives and innovate to reduce activities and events that result in loss of production (operation shortfall).

Performing reactive maintenance is resulting in a high production shortfall because reactive maintenance takes longer time and is not planned, costly and requires a lot of workers. Therefore, condition monitoring must be encouraged to cross the boundaries of production efficiency in order to achieve the goal that until now seems unattainable, which is zero unplanned shutdown

A. Liquid or Agile Maintenance Organization

In general, most of organization structures are rigid organizations. Rigid Organization structure is not really adaptable with disruption, composed mainly in horizontal line and high in vertical line, not agile and have long process in decision making and there is no data exchange activities.

To face the challenge of achieving objective to reduce unplanned shutdown, organization shall become liquid organization, which is mainly decentralized and agile business model, make short process of decision making in organization, create big data and perform data exchange across functional to make precise decision. Each of the "Agile Team" have ability and capability to exploit local opportunities to maximize potential. Figure 3 is the liquid organization model for maintenance activities to improve the quality of PM and PdM activities. This agile organization also encouraging innovation by prioritizing the concept of design thinking through structural processes, production team could focus on many new sights, very practical.



Figure 3: Liquid Organization for Maintenance Work

B. Operator driven reliability, Level 1 Maintenance

Level 1 routine or "first line" maintenance or operator driven reliability is maintenance activities that normally carried out by the production operators without specific tools. The purpose of level 1 maintenance is to optimise maintenance and operations work load, improves knowledge and awareness of production operators, encouraging ownership of plant and equipment.

Typical level 1 maintenance tasks which is mainly work, such as: routine greasing with no "grease gun", oil topping up, visual oil quality monitoring (e.g.: if oil bottle is dirty, oil emulsified, etc) gauge zero adjustment, chart replacement on recorders, housekeeping, etc.

Strengthening level 1 maintenance activities means sharpening predictive maintenance because condition monitoring is also carried out by production operators, increasing information and data so that predictive failure analysis can be done in more precisely.

In this level 1 maintenance, the production operators will be assisted by the field maintenance team, as part of coaching, whenever required. Knowledge maintenance methods are indispensable to ensure that the correct transformation of data into information and transform the information into explicit knowledge so as to the sustainability of the history of the equipment and the expertise of the production operator

C. Big Data Analytics

In this study, the Statistical Quality Control (SQC) method was used to analyze a failure event in one of the turbo-compressor units in an upstream oil and gas company in Indonesia. Failure of the turbo-compressor unit was occurred in quarter-4 of 2019, it was a surprise event and was not detected early even though the condition monitoring activities in the turbo-compressor unit has been carried out carefully through data retrieval from readings of about 230 sensors in real time.

This SQC covers the quantitative aspects of quality management. Managing performance quality using SQC techniques involves periodic sampling of a process and analysis of this data using statistically derived performance criteria. This SQC is to convert the data to become information about the equipment condition.

Graphs X - and R- (range) are used in the control of statistical processes. In attribute sampling, the condition is good or bad, it falls into a category or not, and this is a go or no-go situation. In variable sampling, it needs to be measured in a specific unit of measurement, and then a control chart is developed to determine the acceptance or rejection of the process based on those measurements.

$$\text{Upper control limit for } \bar{X} = \bar{\bar{X}} + A_2 \bar{R} \quad (1)$$

$$\text{Lower control limit for } \bar{X} = \bar{\bar{X}} - A_2 \bar{R} \quad (2)$$

$$\text{Upper control limit for } R = D_4 \bar{R} \quad (3)$$

$$\text{Lower control limit for } R = D_3 \bar{R} \quad (4)$$

Number of observations in each sample is 5 observations.

Table 1: Factor for R-Chart (source: Jacobs, F. Robert, Operation and Supply Chain Management)

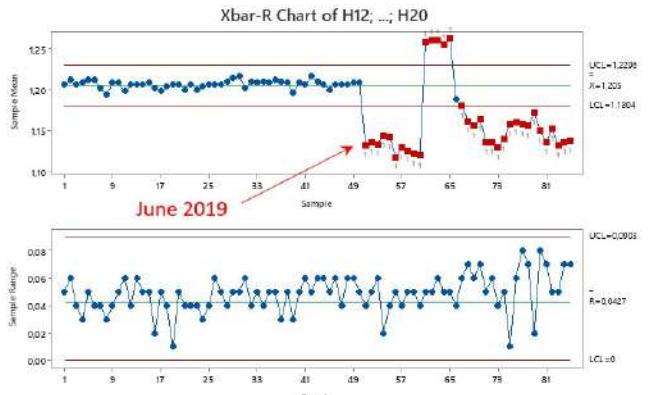
NUMBER OF OBSERVATIONS IN EACH SAMPLE <i>n</i>	FACTOR FOR \bar{X} -CHART <i>A₂</i>	FACTORS FOR R-CHART	
		LOWER CONTROL LIMIT <i>D₃</i>	UPPER CONTROL LIMIT <i>D₄</i>
2	1.88	0	3.27
3	1.02	0	2.57
4	0.73	0	2.28
5	0.58	0	2.11
6	0.48	0	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86
9	0.34	0.18	1.82
10	0.31	0.22	1.78
11	0.29	0.26	1.74
12	0.27	0.28	1.72
13	0.25	0.31	1.69
14	0.24	0.33	1.67
15	0.22	0.35	1.65
16	0.21	0.38	1.64
17	0.20	0.38	1.62
18	0.19	0.39	1.61
19	0.19	0.40	1.60
20	0.18	0.41	1.59

Dry gas seal behavior of turbo-compressor was observed because dry gas seal was failed at that time. In January 2019, Turbo-compressor was in its best performance because the condition was ideal, such as: gas turbine (as driver) was just overhauled, operation condition was ideal at that time (e.g: clean gas on dry gas seal). This condition used as baseline (chart 2).



Chart 2: Turbo-compressor dry gas seal baseline

Based on the observation of turbo-compressor's dry gas seal by using SQC along the year 2019, it found that the test failed starting from June 2019 (chart 3). It is proven that the indication was considered as early warning prior to the failure occurred in quarter-4 of 2019.



At least one estimated historical parameter is used in the calculations.
Chart 3: Dry gas seal test result by SQC

D. Back-up/Redundancy System Optimization

Equipment redundancy strategy aims to avoid major incidents if there is a failure in the equipment. Redundancy is generally applied to vital equipment based on its criticality assessment.

However, in some cases the occurrence of unplanned shutdowns is due to mistaken in establishing a running policy on equipment with the redundancy arrangement. One of the reasons is that redundant equipment operates outside the design limit of the equipment, lower or higher than the manufacturer's recommended operating conditions.

Six sigma can be used as a statistical methodology that is applied to recognize and correct problems that arise, so as to increase productivity and effectiveness. The mission of six sigma is to continuously try to suppress variations that can result in defects in the process, with which must be suppressed under mean time between failure (MTBF), maintenance efficiency and accuracy of running policies over equipment with redundancy / sparring units.

E. Provision and Predicting Critical Spare Parts

Spare part management to be carried out through the material management module at CMIMS and under the responsibility of the supply chain team. Spare part availability will be assessed by type, criticality, and consumption history. Therefore, material management is highly recommended to be integrated with CMIMS so that consumption history can be maintained and sustained as the basis for analysis to determine the minimum stock requirement and avoid the unavailability of spare parts to carry out maintenance activities.

In the new project phase, the identification and quantity of parts must be determined and must be available prior to project submission. Reserve requirements should take into account the degree of criticality of each equipment, the amount of equipment on site and the delivery time. Identification and quantity set-up of parts should cover

the entire operational life. The participation of the surface facilities maintenance team during the project phase is necessary to ensure that all necessary parts are available for continued operation.

IV. RESULT AND DISCUSSION

Big data management in the field of maintenance surface facilities is carried out both manually and digitalization. CMIMS (Computer Maintenance Inspection Management System) is a system that is widely used to manage data maintenance manually. Sensor reading installed in the equipment is a method of condition monitoring in real time data and digitalization by collecting and storing data through PDGS (Process data Control System), PI (Plant Information) and data in back-up through external storage devices. The operating data that has been monitored and collected requires data processing, analysed and compared with baseline historical data ideal operating conditions.

Statistical Quality Control can be used to do predictive analysis on maintenance activity. However, expertise and experience are required to correctly select which parameter to be monitored. This is because there are huge data on machinery parameter, especially turbomachinery. Wrong selection on parameter data will lead to wrong conclusions.

In this case example, Statistical Quality Control could show healthy and unhealthy condition of the machine. Even though the dry gas seal was still working within its operational range (there was no alarm nor alert when it ran along 2019, but this Statistical Quality Control method could show significant abnormal behavior of the machine starting in June 2019. Statistical Quality Control can be used for Predictive Maintenance. Therefore, production loses because of unpredictable breakdown equipment can be avoided in the future.

V. CONCLUSION

More in-depth analysis is needed because the damage is not due to age, some of the symptoms of failure are not visible and some cannot be measured directly by the measuring instrument. The behavior of the equipment needs to be monitored from time to time. By using this Statistical Quality Control platform, the condition monitoring team can capture and observe the indication of hidden failure consequences and achieve efforts to reduce unplanned shutdowns in upstream oil and gas industry operations.

On the other hand, the condition monitoring team can determine the type of algorithm to develop AI-based software (Artificial Intelligent) according to the needs of

operations management to reduce unplanned shutdowns. Condition monitoring teams can choose partnerships to develop AI as a tool to reduce unplanned shutdowns and efficiently improve operational reliability.

Figure 4 is a resume of this study to find a solution to reduce unplanned shutdowns in surface equipment in upstream oil and gas companies.

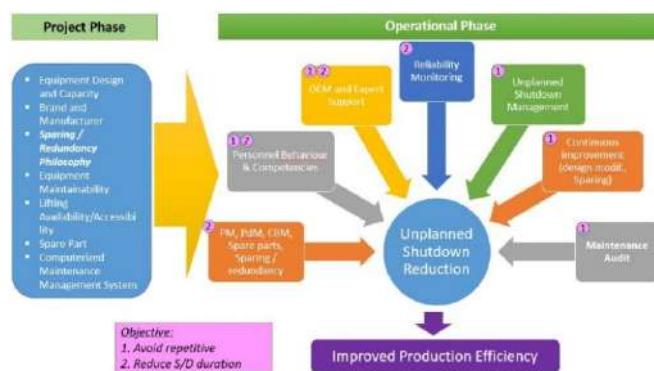


Figure 4: Elements to reduce unplanned shutdown

ACKNOWLEDGMENT

This research was conducted to answer the challenges in Indonesia in the energy sector, especially in the oil and gas sector. In carrying out this research, we are grateful for the professional support to the surface facilities team at PT. Pertamina Hulu Mahakam (PHM) and PT. Pertamina EP Cepu (PEPC) colleagues in SBM class MBA-64. Thank you for the guidance of my professor for this research, Dr. Mursyid Hasan Basri, all lecturers of SBM-ITB class MBA-64 and staff of SBM-ITB

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Paper 51

Capacity Planning Of Additional Production Capacity
Project: Study Case XYZ Coffee

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ICMEM

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Abstract - XYZ Coffee is a micro, small, and medium enterprise producing specialty green coffee beans, Arabica Kamojang. XYZ Coffee has a problem related to a gap between its production capacity and demand. The annual production capacity of XYZ Coffee for green coffee beans has reached 15 tons. Due to the increase in annual demand and the company's wish to expand its domestic and international market, XYZ Coffee plans to increase its production capacity. XYZ Coffee's production process is uneven because it depends on the harvest period, from April until August. Since this will be the first time XYZ Coffee plans an additional production capacity project, the company does not know how to design the detailed capacity planning and check whether it will be feasible and beneficial financially.

The purpose of this research is to investigate the detailed capacity planning for the XYZ Coffee to produce 50 tons of green coffee beans per year in order to meet customer demand both domestic and international, to find out whether the additional project is feasible, and to find out the variable that is greatly affected the project feasibility.

Keywords - Coffee Green Bean, Production Capacity, Capacity Planning, Monte Carlo Simulation, Sensitivity Analysis

I. INTRODUCTION

Coffee is an essential type of beverage for most people around the world. Customer satisfaction and its economic value contribute to the countries producing and exporting the coffee bean [1]. Reference [2] mentioned that coffee is the essential food commodity worldwide and ranks second, after crude oil, among all commodities. In addition, [3] added that coffee is a beverage people enjoy, particularly in Indonesian society. Therefore, coffee is essential in our daily lives as a food commodity and human lifestyle.

XYZ Coffee is one of the MSME partners of Bank Indonesia West Java Representative Office. XYZ Coffee was established in 2012 by Ibu Hj. Eti Sumiati, a retired civil servant. Wanoja comes the Sundanese, which means "woman" because, in the beginning, only woman farmers joined this farmer association. XYZ Coffee XYZ Coffee plantation is located in Kamojang volcanic area, Bandung Regency, with an altitude of 1500 – 1700 meters above sea

level, with a temperature of approximately 18°C. XYZ Coffee produces specialty coffee called "Arabica Kamojang". The coffee is processed from a coffee plantation of around 90 hectares (2022 data).

XYZ Coffee wants to increase its production capacity to fulfill domestic and international demand. The increased capacity is indicated by demand trend, which always increases yearly. The XYZ Coffee demand and production data from 5 years are stated below.

Table 1. Wanoja Green Coffee Bean Demand and Production from 2017 – 2022

Year	Green Bean Demand (In tons)	Green Bean Production (In Tons)
2017	3	3
2018	5	5
2019	8	8
2020	13	13
2021	15	15
2022	50 (forecasted)	15 (current) 50 (planned)

Based on table 1, XYZ Coffee green bean demand is increasing annually. Furthermore, based on the company's prediction, the demand will increase to 50 tons of coffee green bean. Several issues had caused the increasing trend of coffee green bean production. First, customer confidence in XYZ Coffee is rising since the company can produce high-quality green beans (the company had won second place in the Indonesia Specialty Coffee Contest with a score of 86,16 in 2015). Second, some of XYZ Coffee's customers are cafes and want to open a new branch around Bandung. Therefore, they will require more green beans from XYZ Coffee as the primary raw materials for their espresso machine.

On the other hand, some of their customers are coffee roasters, and their demand for Arabica Kamojang is also increasing. XYZ Coffee, as their Arabica Kamojang suppliers, have to increase its green bean production to fulfil the demand of these coffee roasters. In addition, from this year (2022) the company has wanted to expand its domestic and international market to capture more potential customers. The Cup of Excellence Indonesia 2021 affected the XYZ Coffee brand domestically. The XYZ Coffee brand is rising because the company won second place in the Cup of Excellence 2021 with a score of 89,04.

The current coffee green bean capacity production in XYZ Coffee is 15 tons annually. Since the demand trend has been increasing over the last few years and the company wants to expand its domestic and international market, the company wants to increase its green bean production capacity from 15 tons to 50 tons. This number was chosen because of the current maximum potential green bean production from the XYZ Coffee plantation. From this year (2022) the XYZ Coffee plantation area will be 90ha and can produce 350 tons of coffee cherries. After processed, the coffee cherries will become 50 tons of green beans since the conversion from coffee cherries to green coffee beans is 1 to 7 (1kg of green coffee bean from 7kg coffee cherries processed).

However, the production system is different from the production system of manufactured goods generally, where the green bean could not be produced monthly. The green bean could not be produced monthly since the harvest period for Arabica Kamojang coffee is only five months in 1 year.

The harvest period in XYZ Coffee plantation is every April until August, and the peak harvest season is from every May to July. Furthermore, to meet demand from September to December (this year) and January to March (next year), XYZ Coffee can only rely on existing stock before the production is conducted next April. The company can handle the situation by providing a monthly sales quota. However, the current capacity could not process the coffee cherries to become the green bean on time since the current capacity can only produce up to 15 tons of coffee green bean. Therefore, to make the company able to produce up to 50 tons of green beans, XYZ Coffee needs additional assets and human resources. For instance, one of the stages of coffee bean processing is that the coffee bean will be dried with direct sunlight. Since they want to increase the production capacity, the existing drying area is not enough to accommodate the coffee cherries. Thus, they have to rent a new land to dry the coffee cherries.

On the other hand, after the drying process is completed, the following process is coffee bean hulling. The coffee cherries are peeled after previously dried to separate the green bean and its skin with the huller machine. This year, XYZ Coffee wants to increase its production capacity, and they need other assets such as another coffee huller machine and a coffee huller machine. In addition, the existing area could not accommodate the new machine. Therefore, they had to build a new area. Because this is the first time XYZ Coffee will implement an additional production capacity project, the company does not know how to design the detailed capacity planning and check whether the additional production capacity will be feasible and financially beneficial.

II. LITERATURE REVIEW

A. Operation Management

According to [4], the activities related to generating goods and services through the transition of inputs to outputs are referred to as operations management. Meanwhile, [5] mentioned that operations management (OM) is the administration of business procedures inside an organization to achieve the best level of efficiency achievable. It is concerned with transforming materials and labour as efficiently as feasible into goods and services to maximize an organization's profit.

B. Strategic Capacity Planning

The capacity planning comes from the term capacity. According to [6], capacity is defined as the ability to retain, acquire, store, and accommodate. Meanwhile, [7] defined capacity as the number of committed resources obtained for long-term use. Firms obtained the capacity to satisfy long-term demand estimates since it is costly to change on an as-needed basis. The capacity of a production system is vital. A production system that fails to manage its resources, ensuring that capacity is available and efficiently employed, tends to lose its competitive advantage.

C. Net Present Value

[8] define Net Present Value as the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is a calculation used in capital budgeting and investment planning to determine the profitability of a proposed investment or project. The NPV is the outcome of computations used to determine the present value of a future stream of payments. [9] added that Net Present Value, a long-term financial instrument, assists an individual or business decide whether to invest.

Equation (1) defines about the Net Present Value. According to [10], the net present value (NPV) is constructed by subtracting a project's initial investment (CF_0) from the present value of its cash inflows (CF_t) discounted at a rate equal to the company's cost of capital (r).

$$\sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0 \quad (1)$$

D. Payback Period

Payback periods are widely used to assess a proposed investment. Reference [9] mentioned that the payback period is the amount of time needed for the company to recover its initial investment in the business, as measured from cash inflows. Below is the formula for the payback period. Equation (2) shows the payback period formula.

$$\text{Payback Period} = \frac{\text{Total Investment}}{\text{Annual Cash flow}} \times 1 \text{ year} \quad (2)$$

E. Depreciation

According to [11], depreciation is assigning the cost of a plant asset reasonably and methodically to the value of its usable (service) life. The straight-line technique, which divides the difference between an asset's cost and its estimated salvage value by the number of years it is expected to be utilized, is one of the most often used depreciation methods.

F. Monte Carlo Simulation

According to [12], the Monte Carlo simulation is a method for iteratively testing a deterministic model utilizing sets of random integers as inputs. Meanwhile, [13] define Monte Carlo simulations as a probabilistic approach used to tackle many parameter problems that cannot be solved analytically.

G. Conceptual Framework

Various researchers have attempted to explain and define the concept of the conceptual framework. According to [14], A conceptual framework is a final result of combining several related concepts to explain and provide a better understanding of the phenomenon under examination. Meanwhile, [15] stated that a conceptual framework is a synthesis of many findings from the research literature sources that have been evaluated, outlining the study agenda for a greater understanding of the research aims.

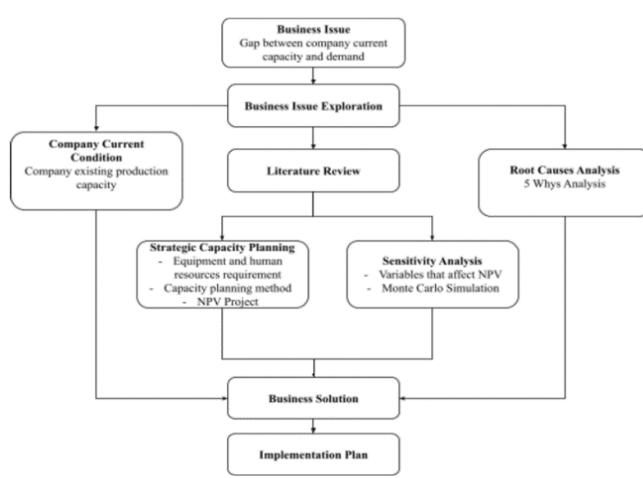


Figure 1. Conceptual Framework

In general, the purpose of a business is to earn a profit and the profit could be earned by fulfill the demand. However, the demand is uncertain and fluctuate because demand could be high and low depending on the situations and conditions. Meanwhile, capacity is fixed, which means that the total amount of the company capacity is constant. Therefore, if the demand exceeds the company capacity, there is a gap between the company current capacity and the demand.

XYZ Coffee currently has 15 tons of green coffee bean production capacity. Since the demand trend has been increasing over the last few years and expand its market both domestic and international, the company wants to increase the production capacity. Furthermore, XYZ Coffee predicted that the demand will be 50 tons starting in 2022, however there is a gap between XYZ Coffee production capacity and the demand because the current capacity is only 15 tons. Therefore, the company has to increase its production capacity to fulfill the demand both domestic and international.

XYZ Coffee business issue will be discussed further in business issue exploration. The exploration of the business issue started by defining the company current capacity condition to describe the XYZ Coffee green bean production process, including the company current equipment and human resources and also the conversion scheme from coffee cherries until it becomes green coffee bean. Next, literature review is needed to determine the theories that is used in the research. The author uses two theories, which are strategic capacity planning and sensitivity analysis. Strategic capacity planning is used to determine the equipment and labor needed for XYZ Coffee green bean production process.

Meanwhile, sensitivity analysis is used to find out the Net Present Value of the additional production capacity project feasibility whether the project is feasible and beneficial for XYZ Coffee. In addition, Monte Carlo simulation is used to analyze an uncertainty with using a random number to the sensitivity or the performance of the simulated NPV of XYZ Coffee. Later, analysis of gap between the company current capacity and demand will be discussed by using 5 Whys analysis with the purpose of help finding the root cause of the gap between the company current capacity and demand.

Business solution is formulated after the company current capacity condition and gap between the company current capacity and demand is determined. Then, Literature review is used as a guideline in formulating the business solution for XYZ Coffee business issue.

After the proposed business solution for XYZ Coffee is formulated, then the next phase is implementation plan

of XYZ Coffee capacity planning with the objective of determining the steps including the resources needed to increase the production capacity and also the timeline of each implementation process.

III. METHODOLOGY

According to [16], Research methodology refers to a collection of systematic techniques used in the research. It is a guide to research and how it is carried out. It outlines and analyzes methodologies, sheds light on the limitations and resources, clarifies the assumptions and consequences, and connects the promise to the twilight zone at the frontiers of knowledge.

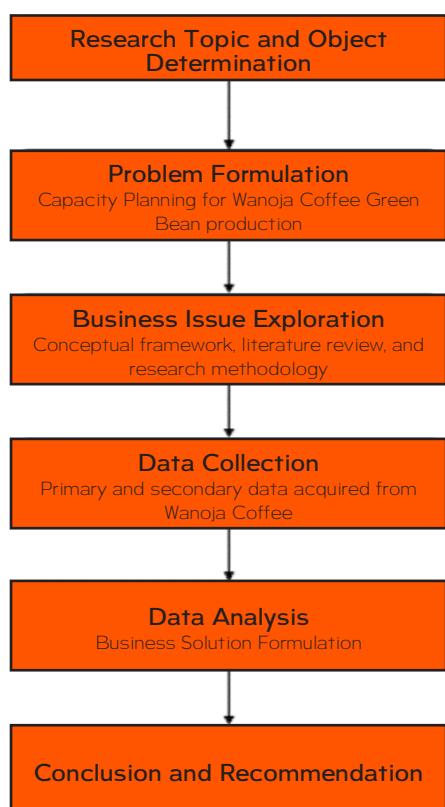


Figure 2. Research Flow

The research was started by determining the research topic and research object. The topic of this research is the utilization of capacity planning. Meanwhile, the research object is XYZ Coffee (specialty coffee producer in West Java), one of Bank Indonesia West Java Representative offices that fostered small-medium enterprises. Next step, the author identified the problem faced by XYZ Coffee in determining the capacity planning for its additional production capacity. In addition, XYZ Coffee does not know whether the additional production capacity is feasible and beneficial financially. Then, the author explores the business issue by formulating the conceptual framework, gathering and reviewing the literature regarding the problem, and constructing the research methodology.

The first step in defining the research objective is identifying XYZ Coffee's problems. In this phase, the author gathered data from Mr. Satre Amambi, secretary and operation manager of XYZ Coffee. After conducting several meetings and interviews with Mr. Satre, the author knows the current condition and problems faced by XYZ Coffee.

In the business issue exploration section, a conceptual framework, literature review, and re-search methodology build a solid body of theory relevant to the study topic and a guide for the research. In this step, the author found sources as a literature review such as academic books, journals, and previous papers with a similar issue to help the author understand better about the topic.

This research uses primary and secondary data to solve the XYZ Coffee business issue. The author gathered the primary data from the interview with Mr Satre Amambi, the XYZ Coffee secretary and operation manager. The interview was conducted using a semi-structured interview where the author prepared several questions to ask. The author added some new questions relevant to the research when the interview was conducted.

Secondary data was obtained from the XYZ Coffee's documents, for instance, the company's green bean production data from 2018 until 2022, product sales, and the cost structure. In addition, the author also uses external resources, which are academic books, peer-reviewed journals, and other resources, for example, other studies. The purpose of using the secondary data is to help the issue formulation, review the literature, ask the questions for the interview, and evaluate the overall analysis.

After gathering all of the necessary data for the research, the author conducted data analysis to give the possible solutions for the research problems. In general, the process is assorting the data. The author designed the detailed capacity planning for XYZ Coffee's additional capacity project, crosschecked the workers required, calculated the cost and revenue using cost-benefit analysis such as Net Present Value and Payback Period, and conducted sensitivity analysis and using Monte Carlo simulation.

The conclusion will be done after the data has been analyzed. It will summarize the results from the data analysis as a final result of the study, which fulfils the objectives of this re-search. After that, XYZ Coffee makes recommendations for what they need to do to overcome their problem and give a recommendation for future research.

IV. (EXPECTED) FINDINGS AND DISCUSSION

A. Proposed Coffee Green Bean Capacity Planning

Based on the introduction, XYZ Coffee production is uneven (from April until August). Therefore, the author proposed capacity planning for XYZ Coffee to optimize production with fewer workers. In calculating the labor requirements for XYZ Coffee, the author uses the average method where the amount of production, which is 350 tons of coffee cherries, will be divided by the production months (April until August), which is five months. Therefore, the average monthly production is 70 tons of coffee cherries. If converted to coffee green bean, the monthly production is 50 tons divided by five 10 tons of green beans. In addition, the working hours and days remain the same, according to XYZ Coffee. The labor requirement calculation is described below.

Table 2. Proposed XYZ Coffee Green Bean Annual Capacity Planning

Production Process	Human Resources Required	Conversion from Coffee Cherries to Coffee Green Bean
Cherry Harvesting	Farmers	70,000kg
Cherry Sorting		69,900kg
Cherry Fermentation	8	69,900kg
Cherry Drying		26,500kg
Cherry Stripping	2	18,500kg
Coffee Bean Sifting		16,500kg
Density Sorting	2	11,000kg
Handpicked	5	10,600kg
Packing	2	10,000kg

The first process is cherry harvesting from farmers with a cherry conversion output of 70,000kg. These cherries will be delivered to the XYZ Coffee production plant for the following cherry sorting process.

Cherry sorting (3 working hours and 24 working days) with the cherry conversion output of 69,900kg.

- o Labors required = 8 persons x 125kg x 3 hours x 24 days = 72,000kg/month.

Next, these eight persons will move to the next station, cherry fermentation.

Cherry fermentation (2 working hours and 24 working days) with the cherry conversion output of 69,900kg.

- o Labors required = 8 persons x 125kg x 3 hours x 24 days = 72,000kg/month.

Next, these eight persons will move to the next station, cherry drying.

Cherry drying (3 working hours and 21 working days) with the cherry conversion output of 26,500kg.

- o Labors required = 2 persons x 250kg x 3 hours x 21 days = 31,500kg/month

Cherry Stripping (2 operators with two machine capacity of 300kg+700kg per hour with three daily machine hours and nine working days) with the cherry conversion output of 18,500kg.

- o Required = 1000kg x 3 hours x 9 days = 27,000kg (2 labors and 2 machines)

Next, these two laborers will move to the next station, coffee bean sifting.

Coffee bean sifting (2 operators, two machine capacity of 200kg+700kg per hour, four machine hours, and nine working days) with the coffee green bean output of 16,500kg.

- o Required = 900kg x 4 hours x 9 working days = 32,400kg (2 persons and 2 machines)

Density sorting (2 operators, one machine with a capacity of 1000kg/hour, three machine hours and nine working days) with the coffee green bean conversion output of 11,000kg.

- o Required = 1000kg x 3 hours x 9 working days = 27,000kg (this happens since the density sorting machine has a large capacity; therefore, two laborers are required to operate the machine)

Handpicking (6 persons with eight working hours daily and 24 working days) with the coffee green bean conversion output of 10,600kg.

- o Required = 5 persons x 10kg x 8 hours x 24 days = 10,800kg

Packing (4 persons with eight working hours daily and 24 working days) with the green bean conversion output of 10,000kg.

- o Required = 2 persons x 25kg x 8 hours and 24 days = 9,600kg

From the table and paragraph above, it could be concluded that XYZ Coffee needs 19 human resources, 1 additional huller machine with capacity of 700kg/hour and 1 additional color sorter machine. In addition, XYZ Coffee also needs several assets such as one additional storage, one additional factory, land rent, and also paracetamol.

B. Sensitivity Analysis

The author obtained the budget plan from Mr Satre, the production manager of XYZ Coffee. Then the author determined the initial investment of XYZ Coffee additional production capacity project

Table 3. Initial investment of additional production capacity for XYZ Coffee

No	Description	Sub total
1	Coffee huller machine	Rp40,000,000
2	Coffee sorter machine	Rp50,000,000
3	Land rent	Rp16,000,000
4	Para net	Rp10,000,000
5	Electricity Installation	Rp12,000,000
6	Water Installation	Rp8,000,000
7	Storage construction	Rp180,000,000
8	Additional factory construction	Rp72,000,000
9	Laptop	Rp16,699,000
10	Lamp	Rp176,000
11	Office furniture	Rp1,250,000
Total		Rp406,125,000

Table 3. describes the initial investment for the additional production capacity project by XYZ Coffee. The initial investment costs Rp406.125.000. The costs consist of machine and equipment costs, installation costs, construction, and other costs. All components are considered fixed costs since whether there is an increase or decrease in coffee green bean produced, it will not affect the cost of those components themselves.

Table 4. NPV Calculation for XYZ Coffee additional capacity project

Year	Annual cash Flow	Cost of capital	Present value
1	(Rp1,148,725,000)	6%	(Rp1,175,640,148)
2	Rp882,400,000	6%	Rp806,024,336
3	Rp882,400,000	6%	Rp759,423,419
4	Rp882,400,000	6%	Rp715,516,770
5	Rp882,400,000	6%	Rp674,148,617
	NPV = Rp2,955,113,142 – Rp1,175,640,148 =		Rp1,779,472,994
	Payback Period = 2.3 years		

Table 4. describes about NPV and payback period of XYZ Coffee additional capacity project. Based on the NPV and payback period calculation above, the results of the NPV are Rp1,779,472,994 which is above zero. The payback period is two years and three months (calculated from year 0, the initial investment). Therefore, the investment is feasible from the NPV side because the value of the money exceeds zero. From the payback period side, the investment will return in 2 years and three months (from year 0) which is faster than the determined specified time by XYZ Coffee (5 years). Therefore, the project of additional production capacity is feasible and beneficial for XYZ Coffee because, from the NPV side, the project value is above zero. The money return time is faster than the specified return time determined by XYZ Coffee from the payback period.

Based on the literature review, sensitivity analysis aims to assess the incremental impact on project NPV by adjusting the variables while holding other factors constant. Below is the sensitivity analysis of the XYZ Coffee NPV project.

Based on XYZ Coffee NPV calculation, there four factors of NPV: production volume, unit production cost, sales volume, and selling price. However, the production and sales volume of XYZ Coffee is constant because the company planned to produce 50 tons and sell 50 tons of green coffee beans. Meanwhile, unit production cost and selling price value fluctuate due to external factors. Based on the company information, the price of coffee cherries affects the unit production costs and the selling price. Below are the input variables for the sensitivity analysis.

Table 5. Input Variables for Sensitivity Analysis

	Optimistic	Base Case	Pessimistic
Change in Production Cost	-6.25%	0%	6.25%
Change in Selling Price	25%	0%	-25%

As mentioned in the beginning, the input variables are change in production cost and change in selling price since both variables affected the NPV and payback period simulation for XYZ Coffee. The +6.25% change in production cost and +25% are obtained from XYZ Coffee experience while the production cost and selling prices increase and decrease.

Table 6. Summary of Sensitivity Analysis Result

Variables	Project NPV		Estimated Range
	Optimistic	Pessimistic	
Change in Production Cost	Rp3,306,363,647	Rp252,582,340	Rp3,053,781,308
Change in Selling Price	Rp8,452,603,893	-Rp4,893,657,905	-Rp13,346,261,798

Based on the description in table 6, the highest estimated range from the calculation result is the change in the selling price. Therefore, the change in the selling price is the most sensitive variable to the projected NPV.

C. Monte Carlo Simulation

The Monte Carlo simulation is to find the results of the NPV based on random values. Below are the results of the Monte Carlo Simulation of XYZ Coffee Net Present Value acquired from around 1000 trials.

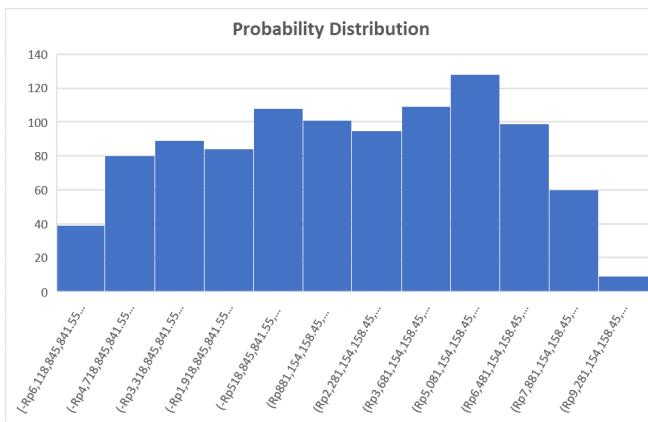


Figure 3. Probability Distribution of XYZ Coffee NPV Monte Carlo Simulation

Based on figure 3.8, the resulting NPV before conducting the Monte Carlo simulation is Rp1,779,472,993.55. Then, the NPV after the Monte Carlo simulation has an average of Rp2,126,041,163.11 from 1000 trials; the average NPV is around Rp2 billion, which is above zero, and the project is still feasible. In addition, the maximum NPV is Rp9,723,596,648.46. The minimum NPV is -Rp6,118,845,841.55. From the maximum and minimum NPV; it could be concluded that if XYZ Coffee could sell its green coffee bean at a certain price or if there is a change in production cost, the maximum NPV that the company will get is around Rp9.7 billion and the minimum NPV that the company will get is minus Rp6.1 billion.

The standard deviation of the XYZ Coffee NPV using Monte Carlo simulation is Rp4,053,683,478.48 which is above the average NPV. From the standard deviation, it could be concluded that the additional production capacity project has high volatility. Next, the median is Rp2,254,972,556.47 which means that the median value NPV of XYZ Coffee from 1000 trials is around Rp2.2 million. The skewness is -0.122, which is near zero. From the skewness, it could be concluded that the distribution of NPV results is centered on the NPV value. The distribution's kurtosis is -1,090, which means that the data distribution tends to be flat. In addition, the NPV below zero is 30% which means that there is a probability of 70% from 1000 trials to generate a positive NPV. Therefore, the project is still feasible.

V. CONCLUSION

As mentioned in the beginning, XYZ Coffee targeted the production capacity of 50 tons of raw green beans to fulfil domestic and international demand. The production process of XYZ Coffee is uneven since the production process depends on the harvest period. The harvest period of XYZ Coffee is from April until August. The detailed capacity planning consists of the production process from cherry harvesting until packing, including labor and machine required, and the conversion from coffee cherries to green coffee beans. To produce 50

tons of green coffee beans, 350 tons of coffee cherries are required (with the conversion from 7kg of coffee cherries to 1kg of green coffee beans).

From the findings, it could be concluded that for additional production capacity from 15 to 50 tons of green bean, the company needs:

- o nine additional human resources.
- o One additional huller machine with a capacity of 700kg/hour.
- o One additional color sorter with a capacity of 500kg/hour.

In addition, the company also needs new buildings and land rent, which are:

- o One additional storage with the capacity of 60m².
- o One additional factory with a capacity of 24m².
- o Land rent with 2000m².
- o Para net with 1000m².

Based on Net Present Value and Payback Period Calculation, the project NPV is Rp1,779,472,993.55 which is above zero, and the payback period is 2.3 years faster than the specified return time determined by XYZ Coffee (5 years). Therefore, the project is feasible and beneficial for XYZ Coffee because the project value is above zero from the NPV side and the money return of the project is faster than the determined specified time from the company.

Sensitivity analysis is made by taking two variables: unit production cost and selling price, because both variables' value fluctuates and affects the company's NPV. Based on the value range, the highest estimated range from the calculation result is the change in selling price results. Therefore, in other words, changing the selling price is the most sensitive variable to the projected NPV. Meanwhile, the scenario analysis using Monte Carlo simulation with 1000 trials shows that the resulting NPV before conducting the Monte Carlo simulation is Rp1,779,472,993.55. Then, the NPV after the Monte Carlo simulation is Rp2,126,041,163.11. In addition, the maximum NPV is Rp9,723,596,648.46 and the minimum NPV is -Rp6,118,845,841.55. The probability that the NPV of XYZ Coffee to become below zero is 30%. From the sensitivity analysis, it could be concluded that the additional production capacity of XYZ Coffee is still feasible and beneficial for the company.

According to the findings and discussion, the managerial implications are follows:

- o XYZ Coffee has to implement the additional production capacity project because the Net Present Value is above zero and the payback period is faster than the specified time determined by XYZ Coffee.
- o XYZ Coffee has to build additional storage, factory, purchase additional assets, and hire more workers to implement the additional production capacity. In addition, XYZ Coffee has to conduct training for the new workers to ensure they understand XYZ Coffee production process and produce high quality green coffee beans.

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Paper 52

Transitioning to Effective Waste Management In
Supporting the Creation of Sustainable Food Supply
Chain in Bandung Regency

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ICMEM

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Abstract- Achieving sustainable food supply chain is one of the goals of Bandung Regency's Government. However, currently, 43% of total waste in Bandung Regency is food waste. Meanwhile, products that are considered as food waste actually can be utilized more optimally through effective waste management. Therefore, this study aims to develop effective food waste management by first identifying the current food waste management in Bandung Regency's Food Supply Chain. The research method used is a soft system methodology, with data collection done through interviews with related stakeholders. The results show that food waste management in Bandung Regency's Agriculture Supply Chain has not been implemented optimally even with assistance and support from the government and NGOs. This is because implementing food waste management involves changing habits in society. In addition, the absence of things that can motivate the community and the many obstacles in its implementation make the society reluctant to make changes. Therefore, this study recommends a transformation to answer the gap which is summarized in a conceptual model that refers to the ADKAR framework.

Keywords- Changing Habit, Effective Waste Management, Food Waste, Sustainable Food Supply Chain

I. INTRODUCTION

According to the Food Waste Index 2021 [1], by UNEP the number of food wasted globally in 2019 reached up to 931 million tons a year and about 17% of the total global production are contributing to this huge amount of waste. Whereas the food is wasted, unfortunately there are lot of negative effect due to the existence of food waste starting from social problem related to hunger [2] to environment problem that lead to global warming [3], [4]. In response to this problem, the United Nations has included the problem of food waste as one of the goals in the 2030 Agenda for Sustainable Development, namely SDG 12 regarding responsible consumption and production.

Indonesia, which is committed to contributing to the sustainable goal, is also trying to make efforts to establish a more sustainable production and consumption system [5]. One of the area that is being pursued to reduce food waste is the Bandung Regency, which is known as one of the regions that have advantages in agriculture sector. However, currently, the production of agriculture products

have not been fully maximized and utilized [6], as the percentage of food waste reaching 43%, the same as the largest waste contribution [7].

In response to this problem, BAPPEDA is trying to develop a more sustainable food supply chain to be applied in Bandung Regency. The effort that is currently being planned is creating a food hub. However, this food hub creation is only focusing on the prevention action. Meanwhile in food waste management, both prevention and handling of waste is necessary. However, currently, there is no data or research about the current food waste management in Bandung Regency's Food Supply Chain. Therefore, this research will focus on identifying food waste in Bandung Regency's Food Supply Chain in terms of supporting the establishment of a more sustainable food supply chain.

II. LITERATURE REVIEW

In conducting the research, the theoretical review is done to gain knowledge and perspective in understanding the existing research on relevant topics and/or area.

A. Creating Sustainable Food Supply Chain

The term sustainable supply chain has meaning supply chain management that focuses on being able to maintain the ability to meet current and future needs in the economic, social, and environmental spheres [8]. Whereas, supply chain itself is the process of maximizing the value generated in the business while fulfilling customer demand [9]. Therefore, the definition of sustainable agriculture or food supply chain leads to the process of maximizing value generated in the agriculture or food sector but also considering how to maintain the current ability to meet demand in the future.

In the implementation, there are fundamental differences between food supply chain and other supply chains that also must be considered. First, the unique characteristic of food which is perishable and continuously changing quality [10], especially in fresh agricultural products. Besides, not only is the quality itself changing naturally, but the perception of each customer toward the quality of food products also tends to be different [11]. Unfortunately, these unique characteristic has also brought problem to the food supply chain [12], [13], including food loss and waste. Addressing the problem of food loss and waste is

said to be one effective way to start forming a sustainable supply chain [14].

Some of the efforts that are currently being made are related to supply chain efficiency or related to the waste prevention effort. As mentioned by Hanson et al[15], management problem in the supply chain process are also contributed to generating food waste. The example efforts of increasing supply chain efficiency are optimizing the production factor such as infrastructures [16], forecasting to avoid overproduction [17], shortening the supply chain [18] or by building coordination among supply chain actors [19], [20].

However, in creating a sustainable supply chain, waste prevention action is not enough. As the current economic system that is still widely used today, the linear economy [21] that discarding all things that are no longer used or wanted, is also naturally increasing the number of waste including food waste [22]. In addition, the high number of waste that has been collected in the landfills will also keep increasing due to the increase in population, meanwhile, the capacity of landfills is limited. Therefore, efforts in handling waste specifically in utilization of waste are increasingly becoming necessary, including in this research context food waste management.

B. Food Waste Management

One of the reasons that waste management has not been carried out effectively is due to the ambiguity of what is actually waste as there is no clear agreement on the meaning of waste [23]. Therefore, in order to make waste management effective in this context is food waste, it is necessary to have a proper understanding of food waste management as a whole.

Food Waste – Food waste which is considered to be one type of waste that is not separated or specified in more detail. Meanwhile, food waste is also related to other similar terms that are often considered to have the same meaning such as "food loss" and "surplus food" [24]. While, these terms actually refer to a different meaning, although it is undeniable that they have the potential to turn into food waste [13], [25].

Some researchers define food waste as all food that can actually be eaten but is not consumed and thrown away [26], [27], which is related to the term "surplus food". Meanwhile, there is also definition that is related to "food loss" that defines food waste as food that undergoes the process of degradation or destruction at any stage of the supply chain starting from the upstream to the downstream [26]. Last, food waste also defines as all food as well as associated with inedible parts, that is removed from the food supply chain to be recovered or

disposed of [15], [28]. This definition seemed to be the most appropriate definition that can cover the previously mentioned definition and also the context of this research. As it is also mentioned that both inedible and edible parts of food can be used by all stakeholders therefore both of them must be considered in terms of ensuring the efficiency of sustainability efforts [28].

Despite the broad definition of food waste, the waste can be identified in more detail. One of the ways to identify waste that can support waste management is by categorizing or classifying as mentioned by some researchers, as it can support in order to find the most appropriate waste management alternative [29]. One of the most common food waste categorizations is based on the edibility and possibility of avoidance [24], [28], [30]–[33].

Based on edibility, generally, there are two categories for the type of food waste, namely edible and inedible [32], [34]. Edible waste refers to all parts of food that can be eaten by humans however due to various reasons, the food is not sold or consumed. Whereas inedible waste typically refers to by-products obtained during production at farms or manufacturing. Based on the possibility of avoidance, there is three categories type of food waste, namely avoidable, possibly avoidable, and unavoidable waste [32], [35], [36]. Avoidable food waste refers to all food or parts of food that are considered edible by the vast majority of people but thrown away because it is no longer wanted or has passed the consumption period. Meanwhile, unavoidable food waste is food waste that arises from food that is not and cannot be eaten under normal circumstances such as fruit skin, bones, eggshell, etc.

Teigiserova, Hamelin, and Thomsen [24] made a simple matrix to categorize food waste into six distinct categories, namely edible, naturally inedible, industrial residue, inedible due to natural causes, inedible due to ineffective management and not accounted for. The matrix can be seen in Table 1.

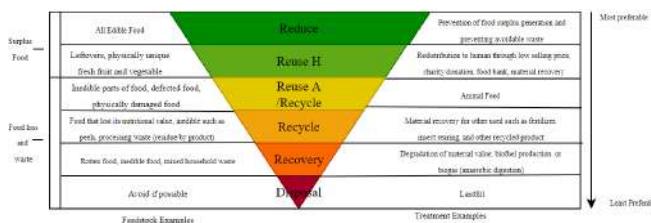
Food Waste Management based on Waste Hierarchy - Food waste hierarchy shows how food waste should be handled based on its condition. With the implementation of this food waste hierarchy, waste management can be maximized, especially in reducing the negative impact on the environment [37].

The food waste hierarchy is usually connected to the R Principles as well. The most common and practical R principle that is used and mentioned in some research in managing food waste is the Four R Principles, namely reduce, reuse, recycle and recovery [38]. Reduce principle

Table 1 - FOOD WASTE CATEGORIZATION

Edible	Inedible	Other
Avoidable	Unavoidable	Partly Avoidable
All Food	-Naturally inedible (part of the products) -Processing waste residues	-Inedible due to natural causes -Inedible due to inefficient management
Surplus	Food Waste	Food Loss

or sometimes also called prevention is referring to the activity of waste by reducing the input of virgin resources [39]. Whereas, "Reuse" is an effort of reduction by further using the product for a similar original purpose or function which is consumption. Recycling refer to the process of collecting and dismantling used products, components, and materials, separating them into categories, and processing them to be recycled [39], [40]. The last R-principle to be



implemented in the food waste hierarchy is recovery. Recovery is the treatment of food waste especially unavoidable waste for energy recovery [38]. Finally, disposal in landfills is the least preferred option for managing waste as there is no treatment for food waste. Fig. 1 Food Waste Hierarchy shows the level preferable of waste from the reduce principle to disposal.

If taken into deeper analysis, it can also be seen in the food waste hierarchy diagram, that the raw materials (mentioned as the feedstock in Fig. 1) at each level are different from one level to another. The different treatment is not only due to the condition of the waste but also the value of the waste [39]. Therefore, in order to find the optimal waste management alternatives, prior identification regarding food waste is also needed.

Toward Effective Food Waste Management - Only considering the technical aspect of the utilization of waste is not enough in creating effective food waste management. There are other aspects that need to be considered to make food waste management implemented effectively.

The problem of food waste itself is complex and comprises three problem conditions, namely unstructured, cross-cutting, and relentless [41]. This complex problem cannot be overcome by only certain stakeholders, it needs participation from all stakeholders as the problem itself is related to all stakeholders and cannot be solved all at once. This statement is also aligned with other research as mentioned by Allison et al. [42], Sasinovich [43], and Filimonau and Ermolaev [44].

In order for stakeholders to play a role in food waste management, it is important to determine in advance where waste can be generated and which stakeholders can be responsible for the waste generated [45]. Therefore, in this research, it is also carried out first on how the current conditions of food waste management in each actor's supply chain.

In addition, food waste management also implies the relationship of managing waste with human behavior that needs to be taken into consideration as well. The reality is that waste management is not the behavior of today's society, so intervention is needed so that this activity can be carried out [41]. Allison et al. [42], mentioned that human behavior itself is influenced by three aspects namely motivation, capability, and opportunity. According to his research, it is proven that motivation indeed leads people to do waste management, however, some barriers that still existed also made waste management not effective can be seen from the people's response of not doing some of the waste management efforts.

In other research, barriers and drivers are also mentioned to influence the implementation of food waste management. Some of the barriers that are often mentioned as impeding the implementation of waste management are lack of awareness, lack of skills and knowledge, and inconvenience of implementation [46], [47]. Whereas the drivers of utilizing waste are psychological motives of actors such as feeling guilty, economical motives not to waste money, and knowledge toward the utilization of waste [46]–[48]. It is also mentioned that identifying these drivers and barriers, as well as trying to address them will lead to the implementation of more effective food waste management. Therefore, this research will also try to identify the barrier and driver of the food waste management.

III. METHODOLOGY

A. Research Method

The research method that is used in this research is the soft system methodology that was developed by Checkland [49]. The soft systems methodology itself is an approach that could help to model the human activity

system which is still unstructured and has problem due to the different perceptions of various perspectives.

Since this research uses the soft system methodology approach, therefore the step in carrying out the research will adopt the steps that had been conducted by Checkland [49]. There is a seven-stage model of SSM. The Fig. 2 represents how the research is carried out.

Based on the Seven Stages of SSM, it can be seen that comprehensive understanding of the Bandung Regency's agriculture supply chain must be obtained in the first place through real-world point view. The result of the analysis regarding the problem is described in form of a rich picture. A rich picture is a tool that can be used to represent the real-world situation comprehensively as it could contain

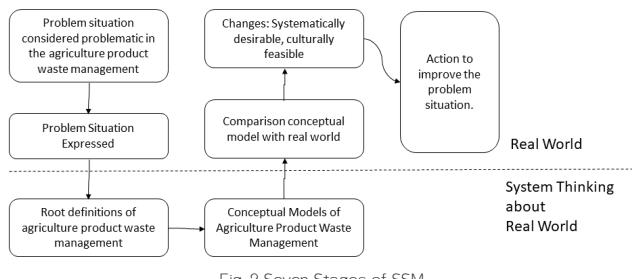


Fig. 2 Seven Stages of SSM

information about the primary stakeholders involved, relationship between stakeholders, and also their concerns that may become the place where problems occurred [50].

After the real situation of food waste management in Bandung Regency's agriculture supply chain is understood, key activities and problem that relate to the problem must be identified in order to create the desire conceptual model [49]. This step is called as root definition. CATWOE framework is used as tool to define the emergent property of the desire condition [51]. The property referred in this framework are customers, actors, transformation, welstanchauung (world view), owner and environment [52]. From all of these elements, the transformation element is the core of the analysis since the objective of SSM research is to generate action recommendation in achieving desired condition that is derived from real world situation [53].

After defining the root definition, conceptual model is developed to represent the way how transformation toward the ideal systems can be achieved, in this research context is the effective food waste management implementation in Bandung Regency's agriculture supply chain. Thus, this research is only conducted until the stage 4 namely the conceptual model formation.

B. Data Gathering

In terms of data gathering, primary data, which collected from interview, is the main source of answering the research questions. Whereas secondary data which is obtained from existing literature, is used as supporting data related to food waste management, reference for making the interview protocol, and for building the conceptual model.

Semi-structured interviews with purposive sampling were conducted with 27 respondents who were involved and related to the supply chain and handling of agricultural product waste in Bandung Regency. The interviews were conducted face-to-face and by telephone. The average duration of the interview was 30 minutes to 1.5 hours. Some additional interviews were also done in order to collect additional information.

Before analysis, all data that has been collected were documented systematically and coded to ease the analysis. Coding is done using combinative coding method which enables researcher to prevent the risk of making the data too complicated, however at the same time researcher can still open to new findings [54]. New findings will then be validated through literature.

IV. DISCUSSION

A. The Real-World Situation of Bandung Regency Food Supply Chain

Actor in Supply Chain Perspectives - Based on the data obtained and references to several studies, there are three main actors who are directly involved in the supply chain of agricultural products, namely farmers, intermediaries,

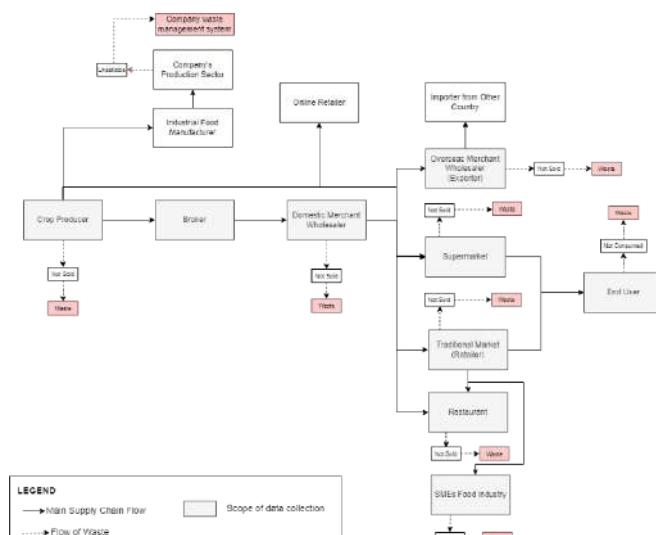


Fig. 3 Current Bandung Regency's Agriculture Supply Chain

and consumers. Each actor has a different role and activity in the supply chain. Although it appears that agricultural products flow from farmers as producers to final consumers, not all products can end up in consumers or in other words sold. Based on the data obtained, most of the unsold products are thrown to waste. In fact, not all of these products are in poor condition, and even some of them still have a quality that is worth selling in the market. Based on their condition, these unsold products can be grouped into three general categories according to the matrix in Table 1 that has been discussed in the previous section, namely surplus food, food loss, and food waste.

Realizing the value remained in unused product, these products can become more useful and reduce the increase in the amount of waste, if treated following the food waste hierarchy. However, due to several constraints and other problems such as limited financial capacity, limited utilization of knowledge, etc; from the many potential uses of unused products, the actors still have not implemented it much, it can be seen in Fig. 3, these products only end up as waste.

Meanwhile, according to the interviews with the government, independent waste utilization by society was indispensable. Considering the fact that it was impossible to handle waste if it was only carried out by the government unilaterally due to limitation in resources. One example of this limitation from the government can be seen in the lack of waste handling facilities in the Bandung Regency which could only cover 16.32 % of the total waste in 2018 [55], even decreased in 2019 due to the increasing amount of waste generation.

Efforts that have been made by the government to enable citizens to play an active role in reducing waste is various, ranging from efforts to reduce waste production

due to supply chain inefficiency, namely by forming clusters to build collaboration between actors in the supply chain, waste utilization by building waste processing units in various areas, directly providing tools for processing waste to residents such as bio-digesters, and others.

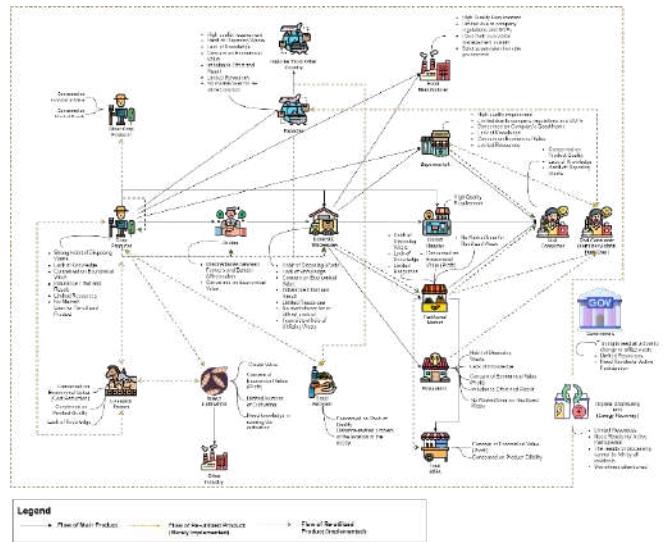


Fig. 4 Rich Picture

However, in reality, people are still not used to managing waste, even though the implementation were assisted by organizations, the percentage of people who were actively involved in undergoing the program only reaches 40%. Even when they are no longer accompanied, people tend to leave the program completely.

The constraints experienced by actors and the priority concerns of actors make it difficult for them to utilize waste and choose to dispose of waste. Fig. 4 Rich Picture shows the problematic situation of the supply chain of Bandung Regency's agricultural products and the handling of waste.

B. Root Definition

Previously, it was explained that the government has been trying to change the way society managed waste, which is usually disposed of the waste directly. Of the many obstacles and concerns mentioned in Fig. 4, it can be concluded that the difficulty of the change effort is because it is related to people's habits, namely the habit of handling waste. The habit of today's society is to immediately throw away any product that is considered useless. Meanwhile, what the government wants to implement is the exact opposite of the current habits. This is a major obstacle because in fact this habit has been going on for a very long time and is continuously being carried out.

However, other obstacles also contribute to making people reluctant to utilize waste. Lack of public awareness of the importance and urgency of the waste problem as well as public knowledge about waste management becomes barrier in food waste management. This can be identified when the interviewees said that they did not feel any negative impact from the presence of such waste and even some of them said that littering was a normal habit. In addition, not a few of them are completely

unaware that the waste they dispose of actually still has value and can be processed and utilized.

This problem was also directly verified by the government and Non-Governmental Organizations (NGOs) working in the solid waste sector. The number of programs and facilities that are often abandoned, cannot be separated from this problem.

However, not all people do not have awareness of the waste problem and its potential to be utilized. There are still some people who have tried to utilize the "useless" product. But, because the results were not commensurate with the effort made and/or the benefit do not look meaningful for them, they also decided to return to the old habit of disposing the waste.

The problem is also related to the concern of the society, namely the economic value of the results of the waste utilization. Based on interviews, some actors even said directly that they may continue to process or utilize waste if the results can be of economic value which can provide them with additional income. However, because of the benefits of utilizing waste, which is currently perceived as only being dominant in the environmental aspect, they are not interested in doing so. In addition, cost which sometimes even increases due to the effort of utilizing the products, makes them even more reluctant.

Still related to constraints on the economic aspect, market or distribution difficulties of re-utilized products also becomes of the barriers of food waste management. For example, one of the informants who once made an effort to reduce waste by recycling them into fertilizer, decided to stop because no one wants to receive it even for free. In addition, it created new problems such as additional costs and the accumulation of waste collected that invites pests.

The last obstacle experienced by actors in utilizing or reducing waste is limited resources. The resources in question vary, ranging from time, funds, and people, to technology. Based on the interview, the main resource limitation is in terms of time. The supply chain actors are already too busy and choose to focus on managing the interests of their main activities which are clearly more productive (in the economic aspect).

In addition, resource limitations that are often disclosed are in terms of budget. As previously mentioned, not all actors in the supply chain have stable financial conditions. This limited financial capability prevents them from being able to carry out supply chain activities optimally because some efforts to reduce waste require money to purchase tools that can support it. Meanwhile some equipment such as cold storage and bio-digester requires a large amount

of funds, therefore some of the existing equipment in several areas (not industrial areas) are currently also a gift from the government or organization.

Apart from these four general limitations, there are other limitations experienced by supermarkets. According to the store manager of one supermarket, it was stated that the supermarket had made efforts to reduce organic waste. However, due to limited space for waste processing, this program was discontinued.

Thus, it can be seen that the habit of disposing of the waste is the fundamental problems faced by the government in making people utilize waste. However, this change will become even more difficult when the people

Table 2 - CATWOE Analysis

Effective Transition to The Habit Of Utilizing Waste	
Customer	Society (which includes all food supply chain actors)
Actor	Government, educational and research institution, NGO, Society
Transformation	Transitioning new habit by considering the driver and barriers of change
World-wide view	Changing habit can be effectively carried out by considering the basic requirement of a person to achieve and sustain change.
Owner	Government
Environment	Agriculture Supply Chain

themselves are not aware of the problems that is trying to be addressed. Without the awareness of the problem, how society will be able to get involved. In addition, this is also becoming increasingly difficult because at this time people do not feel benefited from these changes and the difficulties in distribution for utilized waste products and limited resources make people increasingly reluctant to make changes in habits.

Therefore, it is necessary to transform the way of changing people's habits in handling waste. CATWOE analysis to be able to make changes in waste handling habits into waste utilization can be seen in the Table II. The CATWOE analysis shows how the ideal system is to produce an effective transition to the habit of utilizing waste.

C. Conceptual Model

Based on the CATWOE analysis, the transformation needed is system to change people's habits to waste utilization. In this research, a conceptual model to achieve the ideal system was built with reference to the ADKAR change management model proposed by Prosci in 1998. The reason for choosing the ADKAR model compared to other models such as the Lewin Change Management Model and the Kotter Management Model is the suitability of the model to be implemented in changes that involve

acceptance by people who must experience the change and the scale of the change carried out [56].

Based on the ADKAR model, the first thing to do to be able to make a change is to build awareness of the people involved in the change. This awareness shows people's understanding of what and why there is a change regarding the reasons for the need for the change and the risks if the change is not made [57]. In the context of making people utilize waste, it is necessary for the actors of change to ensure that people understand the problem of food waste, the urgency of implementing waste utilization and its impact if it is not carried out. Because if the society itself does not aware, there is no reason for people to make changes that usually require more effort than their habits [58].

Building awareness is not only about the massive dissemination of information but also the content of the message to be conveyed so that it can attract attention and in accordance with their concerns [59]. Because as also mentioned by Bada, Sasse and Nurse [60], effective influencing starts from being relevant with the audience. In addition, to build awareness more effectively, the government can work with stakeholders who is able to exert influence such as influencers, community leaders, NGOs, universities, and others depending on the target audience of the message want to be conveyed.

The next step to making changes is to build people's desire to utilize waste. This desire shows the motivation that can make someone willing to participate in making changes [57]. In the context of waste utilization, the actors of change need to understand in advance what the desires or needs of the community can be related to the use of waste so that it may be a motivation for them to make changes [58].

Based on interviews with several actors who have utilized waste, they said that indeed they had a positive impact from the waste utilization, especially on the environmental aspect, but this did not make them consider continuing, except for the interviewees who were workers in supermarkets who had environmental concerns in fulfilling corporate social responsibility. Their current main concern is not the environmental aspect but the economic aspect.

The public's concern for this economic value can be a way for the actors of change to motivate people to use waste. This is because turning waste to have economic value is not impossible if carried out properly [61]. Based on reports on waste utilization programs that have been successfully implemented in several areas. Therefore, the actors of change can start paying more attention to efforts on waste utilization that can have economic value so that it motivates people to make changes in habits.

After making the public aware and interested, the next step is, to begin with, the transition to changing people's behavior, namely providing knowledge to the community about how to use waste. This is necessary because, as previously explained, some informants have the desire to utilize the waste, but due to limited knowledge, they can only dispose of the waste or the farthest effort they can take is throw it into the plantation with the assumption that it has turned into compost, which often ends up being collected again because it hinders the next production process.

The knowledge discussed is not limited to providing theoretical information regarding the use of waste. But also an understanding of the new roles and responsibilities of the changes as well as training and education about the skills needed [57]. In order to make delivery of knowledge can run effectively, there are 4 factors that influence knowledge of change that need to be considered, namely the basic conditions of community knowledge, the ability of the community to learn, resources for delivering education or training and access to knowledge itself [57]. Therefore, just as when trying to build awareness, the actors of change need to know the audience of the people who will receive the knowledge so that it is appropriate.

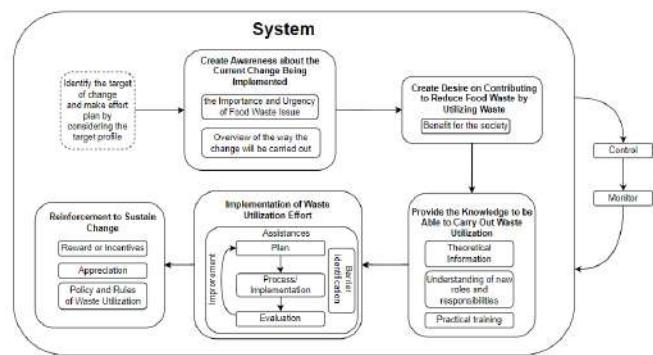


Fig. 5 Conceptual Model

After the knowledge possessed by the community is sufficient, the next step is the implementation of the use of the waste itself. This implementation starts from making strategies and implementation plans to evaluating the implementation. This is important for the actors of change to pay attention to because in fact theory and practice often have differences [62].

As previously mentioned, barrier might appear when the community make changes. To be able to make people make changes, the actors of change should actively listen and provide support to the community to deal with these barriers. When people who are the target of the change feel getting empathy, they will be more open and willing to make the change [58]. The support provided can vary from being open to hearing community difficulties to directly

providing assistance in any form such as training, funds, labor assistance, and others. In addition, support in form of assistance can also serve for evaluations. Evaluation is needed in order to make the implementation of change can be improved and done better by the community [63].

In order to make the changes continuously sustain, reinforcement is needed [58]. This reinforcement can be done in various ways, starting from giving rewards, and appreciation or making these changes as mandatory. It is possible for the government to make it a policy because the government has power over it. Making it a policy is recommended for the government considering the fact that sometimes even though all efforts from awareness to ability have been carried out, the absence of an obligation to utilize waste makes people return to the old habit of throwing waste. Several countries, such as China, Taiwan, and Korea, have shown that with strict and clear rules for managing waste, they have succeeded in getting people to participate in making changes to these habits [64]–[66].

Apart from the ADKAR, the actors of change need to understand in advance the target of change, which in the context of this research is the society. As mentioned several times before, at the awareness, desire, knowledge, and implementation stages, the different conditions of each target require a different approach to make the transition to change effective.

Last, the actors of change need to continue to monitor and control efforts to change people's habits towards the utilization of waste because the formation of new habits itself does take time, especially regarding changes on a large scale, and it is necessary to anticipate a decrease in performance from these changes [58]. With monitoring and control, the actors of change can ensure that the efforts made are in accordance with the conditions being experienced so that adjustments can be made.

Thus, the system for changing people's habits to fully utilize waste can be seen in Fig. 5 Conceptual Model.

D. Proposed Recommendation

Followed are the practical recommendation that can be considered by actor of changes for the implementation of better food waste management.

First, collaborating with various parties to conduct extension to overcome the problem of lack of public awareness. The role of the extension itself is to change the way people think and manage something [67]. Collaborating with many experts and stakeholders can be an opportunity to increase education and awareness about food waste. By doing this, it can help both government

and NGOs to manage the limitation in resource.

Second, using social media to build awareness. With the massive use of social media as a communication tool today [68], social media can be an effective medium for disseminating information to increase public awareness. Social media is proven to have a positive impact in raising awareness or contributing to food waste reduction, especially in the stage of consumer [69]. However, in order to make social media an effective tool to increase awareness, there are several things that must be considered, such as the time, the content and the platform used to disseminate the information or invitation.

Last, implementation of circular economy. A circular economy itself is an economic system that forms a cycle to utilize used resources so that the life of a product can be maintained as long as possible which then has an impact on reducing waste and also the use of eventually new resources[70]. With the implementation of a circular economy, the government is not only able to make people do waste processing technically but also responds to the need and desire of the society for economic aspects.

V. CONCLUSION AND FUTURE RESEARCH

Food waste management in Bandung Regency's Agriculture Supply Chain has not been carried out optimally. It can be seen that at each stage of the supply chain there are unsold products which only end up as waste. If analyzed further, not all products are in the same condition and are actually classified as waste. Some of the products that have the potential to become waste still have value that can be utilized by referring to the food waste hierarchy [24]. Even, efforts to utilize these unused products have actually been pursued and supported by several stakeholders. However due to the complexity of food waste problem [41], these efforts have not been able to make supply chain actors implement the utilization of unused product.

Based on the results of the analysis, it was found that the fundamental reason for not implementing the utilization of waste is because it involves changing habits in the society, as also mentioned by Närvenen [41] that the current behavior of society is not used to managing waste. In addition to the consideration of changing habit, barriers and drivers also need to be put attention to as they impact the success of food waste management [46]–[48]. In Bandung Regency's agriculture supply chain, it was found that there are no perceived benefits from the society's perspective, especially in the economic aspect, while it could become the drivers of implementation. Many obstacles in the waste utilization also make people increasingly reluctant to change their habits.

Therefore, to be able to make effective food waste management in Bandung Regency's Agriculture Supply Chain, the root cause of the difficulty of implementing the utilization needs to be addressed first. This study recommends that there be a transformation in its implementation efforts. The transformation is to make this effort as an effort to change people's habits to manage waste, not just a technical implementation.

The transformation of efforts to change the habit of disposing of waste into handling waste is summarized in a conceptual model that was built referring to the ADKAR (Awareness, Desire, Knowledge, Action, Reinforcement) framework [57]. The essence of the conceptual model is to make change efforts by making the target of the perpetrators of the habit change, in this case the society, aware of the change and making the change willingly because not only are there drivers that make them interested, but the barrier in making the change is also removed.

The managerial implication of this study is to provide transitioning strategies for better food waste management in Bandung Regency's Agriculture Supply Chain by involving all stakeholders to participate, especially for the current actor of changes namely government and non-governmental organizations. The actors of change can follow the conceptual model that has been made in this research to create strategies or programs that are related to form community habits in dealing with waste. Some practical ways that can be considered as they could answer the current problems arise in implementing food waste management such as building awareness through extension and social media; and implementation of circular economy to answer the current gap of the absence benefit perceived by the community. By starting to solve the awareness and motivation problem, it is expected that the food waste management can be implemented better and would reduce the number of food waste

For further research, this research can still be deepened in the area of food waste management, starting from identifying other supply chain actors that have not been included in this study. In-depth discussion of the subtopics in this study such as barriers and drivers of each Bandung Regency's agricultural product supply chain actor in managing waste and the success factors of several regions in implementing the programs that have been made by the government in food waste management can also be done to further complement the findings in related topics. Last, this research can also be developed on other topics related to this research. The topics that can be discussed further are the discussion in the potential economic value in the waste utilization which can be evaluated from the cost-benefit analysis. Thus, the discussion on the topic of this research can be more complete and have more implications both theoretically and practically.

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Paper 53

Supply Chain Contract for Retailer at Poultry Farm

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ICMEM

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Abstract - This study aimed to design a supply contract at a poultry farm. In this farm, Price fluctuation of eggs creates problems between farm-retailer which is fluctuation retrieval between each retailer that results in a buildup of eggs averaging 138 bonds worth 49,68 million. Currently, the farm just uses trusted-based for the egg distribution procedure. If the retailer does not come to acquire the eggs, the owner attempt to locate another supplier to purchase the eggs. This condition causes the fluctuation in egg sales. Observations were made of large retailers totaling four retailers. The work was observed using a questionnaire and direct interview with the supervisor, inventory and warehousing manager, and owner. This study uses the current reality tree to analyze the root cause of the problem that faces the farm and uses the analytical hierarchy process to construct a supply contract selection based on justification. The results showed that the farm implemented a quantity flexibility contract for four large retailers. Based on calculation Implementing a quantity flexibility contract will enhance the supply chain profit equals Rp. Rp48.021.322,- for Retailer A, Rp.17.669.702,- for Retailer B, Rp 26.403.667,- for Retailer C and Rp.44.379.203,- for Retailer D.

Keywords – Distribution procedure, effectiveness, price fluctuation, supply chain contract,

I. INTRODUCTION

Chicken eggs are one of the commodities sources of staple food; the Government observes the development cost. Through the Minister of Trade of the Republic of Indonesia No. 58 of 2018, the Government set about Fixing the Reference Prices for the Purchase of breeders and the Reference Price of Sales in the Consumer. It is necessary to do to protect breeders and consumers from price volatility. For consumers, the stabilization of prices is essential because of the concerns about their ability to meet the household's food needs[1].

Based on data from the basic needs Market Monitoring System (SP2KP, 2022), the national average price of purebred chicken eggs in January 2022 was above the Ministry of trade's reference price of Rp27 709/kg. The price of purebred chicken eggs increased by 5.31 percent compared to the average price of purebred chicken eggs in December 2021, amounting to Rp 26,313/kg. Compared with the price in the same period last year (January 2021)

of Rp 26,713/kg, the price of purebred chicken eggs in January 2022 increased by 3.73 percent [2]. Figure 1 shows the fluctuation of chicken egg prices between 2018-2022.

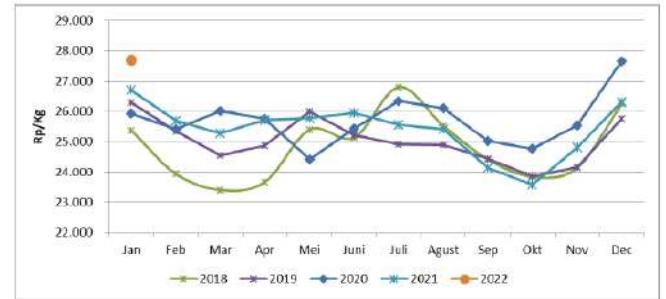


Fig. 1. Development of Chicken Eggs Price (Rp/Kg)

Source : Statistic, 2021

This price fluctuation shows that the production of eggs has not increased because many farms are not full because the chicken farmer cannot do rejuvenation. On the other hand, it is suspected that the Close House (CH) and semi-close house cages rose significantly. They are upper-middle-class farmers and PMDN and PMA entrepreneurs who do cultivation with CH and SCH cages. Many small-scale farms are not filled because, at this time (December - April 2022), small-scale farms do early feed on laying hens, and chick in is delayed. Small farms only have a stock of feed for about 1-2 weeks with KA 17% -19%. So it is not durable stored. Small-scale farm businesses with low efficiency can not withstand the pressure of high input prices and low consumer purchasing power.

Meanwhile, on a medium to large scale, having a stock of feed for 2-4 months is not possible to change the production schedule, meaning the business continues to run. In medium and large-scale businesses, the use of cages CH and SCH efficiency is quite good, not much wasted feed because of the machine's provision, while the feed manually feed wasted 1% -3%. Labor CH and SCH cheaper where 10,000 tail enough one person of power, while in the cage open house need 3-4 people of Labor. The involvement of medium and large scale causes the population of laying hens to shift from small to large medium enterprises. The population can remain or rise, but entrepreneurs become few and do medium and large scale [3].

Al-Ikhlas Farm is one of the Small and Medium Industries (IKM) laying hens in West Sumatra, which was established in 2000 with distribution areas covering Pekanbaru, Jambi, Bengkulu, and Jakarta. Due to the business competition,

currently, Al-Ikhlas farm is facing problems related to the fluctuating price of eggs. The issue that often occurs is a mismatch between supply and demand, the problem between owner and retailer, and this problem is frequently faced every year. Figure 2 show the mismatch between supply and demand in Al-Ikhlas Farm

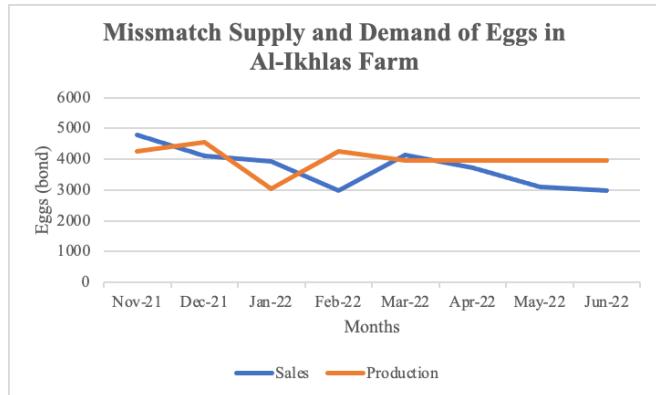


Fig. 2. Mismatch Supply and Demand of Eggs in Farm

Source: Author,2022

Based on this background, the company needs to analyze the root causes of the problem and choose the proper solution of this root cause

II. METHODOLOGY

This study aimed to analyze the root cause of the problem faced by the farm and find the proper solution to that. we will utilize the Current Reality Tree (CRT) to discover the root cause and find the source of the problem. The fluctuation in egg sales is an issue that Al-Ikhlas farm has always had. This fluctuation impacts the buildup of eggs averaging 138 bonds worth 49,68 million rupiahs. The fluctuation in egg sales can be attributed to two factors. In the current situation, the reservation of eggs between the owner and the retailer is based on trust between the two parties; if the retailer does not come to acquire the eggs, the owner attempts to locate another supplier who is interested in purchasing the eggs. This condition causes the fluctuation in egg sales. The variation in egg sales is caused by this circumstance. Furthermore, an individual's incapacity to understand a situation and make the correct option influences the fluctuation in egg sales. Figure 3 show the current reality tree based on the problem faced by the farm.

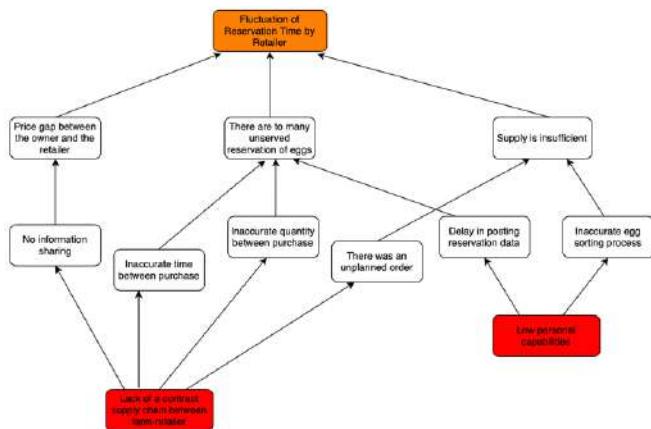


Fig. 3. Development of Chicken Eggs Price (Rp/Kg)

Source : Author

Based on the Current Reality Tree, there are two root causes of fluctuation of egg sales: lack of a contract supply chain between owner-retailer and low personnel capabilities. The solution for the first root cause is to discuss the focus of each contract supply chain, then choose the contract that is suitable for the firm. With implementing a supply contract for distributing eggs, the quantity, and time will be structured periodically with estimated minimum and maximum of product. And the delivery schedule is determined by the control of two parties. Low personnel capabilities are the second root cause. The solution to these underlying issues is to develop proper training to enhance worker abilities. The following Table 1 gives the descriptions of two root causes.

Table 1 - ROOT CAUSES EXPLANATION

Source: Author

No	Root Cause	Description
1	Lack of contract supply chain between owner-retailer	Root cause analysis results show that no sharing of information between two parties, the inaccurate time between sales, and inaccurate quantity between sales were caused by no contract supply chain applied on the farm. The reservation of eggs between the owner and the retailer is based on trust between the two parties; if the retailer does not come to acquire the eggs, the owner attempts to locate another supplier interested in purchasing the eggs.
2	Low personnel capabilities	The reservation of eggs between the owner and the retailer is based on trust between the two parties; if the retailer does not come to acquire the eggs, the owner attempts to locate another supplier interested in purchasing the eggs.

According to the previous chapter, the critical issue is sales egg fluctuations. The main reason for this issue is a lack of a contract supply chain between the owner and the retailer and a lack of employee capabilities, with a focus on the first root cause because Al-Ikhlas farm is already joined with a third party to develop a clear and structured job desc, job spec, and training program. Choosing the best supply contract is regarded as a beneficial activity for improving and smoothing out the distribution process. A supply contract's issue is determining which suppliers can meet its demands, which includes defining decision rights, price, minimum purchase commitments, quantity flexibility, buyback or returns policies, allocation rules, lead time, and quality.

Cai Jianhu [4] defined flexibility contracts after studying a variety of supply chain contracts: the supply chain contract that could achieve entire supply chain coordination while having the capability of distributing the supply chain's gross profit among supply chain members in any way, and further illustrated that the Order Quantity Contract, Buy Back Contract, and Revenue Sharing Contract, Quantity Discount are flexible contracts. Numerous studies show that using such contracts as the Quantity Contract, Buy Back Contract, and Revenue Sharing Contract, Quantity Discount to achieve supply chain system coordination is an effective strategy, regardless of whether analyzing from the perspective of the manufacturer and wholesaler or the perspective of a multi-stage or multi-level supply chain. As the "war" between customers escalated, the connection between supply chain participants evolved from the initial straightforward division of profit to mutual benefit and win-win outcomes[5].

Yuliawati [6] implemented buyback contract for maximizing profit and involved supply chain participants' profit on IKM Batik Siduarjo. Vincent [7] presents an outline of the best option a supplier that manufactures apparel with its retailer may make when deciding between a buyback and a revenue-sharing contract. Lee et al.[8] outline the genesis of QF contracts as a reaction to specific supply chain inefficiencies. Huang et.al. [9] solve profit-maximizing effort level chosen by the retailer is always smaller than the one determined from the standpoint of the supply chain. This is inefficient since the supply chain profit is finally divided between the retailer and the supplier. The cause of this issue is that the merchant suffers the entire expense while only reaping a portion of the benefit of lowering the number of false failure returns.

According to alternative business solutions, there are 4 types of contracts that can be utilized for supply contracts at Al-Ikhlas Farm. In this study, the author focuses on selecting the best contract that is suited to be applied to the organization farm, so that the supply contract must be selected. The AHP approach is one

sort of method that may be used to solve MCDM issues. AHP is used to explain comprehensive choice arguments, as well as to engage in a multi-level hierarchy structure of goals, criteria, sub-criteria, and choices[10]. The AHP process involves the evaluation of criteria and sub-criteria by qualified specialists in their respective fields. One of the most important contributions of AHP is its ability to find the most dominating criterion and sub-criteria for any given objective. The first stage of AHP is to create a hierarchical framework of goals, criteria, and sub-criteria. The AHP model will next be constructed using a pair-wise questionnaire that will be evaluated by specialists. Following that, the questionnaire results will be computed and the geometric mean determined before being built into a matrix structure and the weight of each criteria acquired. The AHP approach, in particular, can evaluate the extent to which responses are consistent or inconsistent through the consistency index[11]. From this, the AHP approach may assist businesses in clearly and efficiently determining the important part of the unique problems considering the final decision.

Data will be acquired through key management interviews as well as a simple questionnaire. As mentioned in the previous chapter, the methodology described in AHP will be used for this research.

A. Identifying Primary and Secondary Supply Contract Selection Criteria

An in-depth interview with owner of farm is conducted to identify the primary and secondary criteria for supply contract selection. AHP criteria for supply contract selection can be seen in Table 2.

Table 1 - AHP CRITERIA

Source: Author

No	Criteria	Sub-criteria	Reference
1	Flexibility	Efficiency Easiness	[12]; [13]; [14]
2	Impact	Risk Benefit	[15]; [13]; [16]
3	Data Completeness	Purchase commitment Warranty Quality	[15]; [17]; [16]
4	Management and Organization	Responsiveness Discipline After sales service	[12]; [15]; [10]
5	Cost	Transportation cost Cost of service	[19]; [17]; [13]; [16];

B. Determining Structure of Hierarchy Model

This phase entails creating the AHP hierarchy model and calculating the weights of each level of the supplier selection model. Based on the identified criteria and sub-

criteria, the developed AHP model has five levels: the goal, the criteria, and alternatives. Following the collection of the necessary sub-criteria, they were identified and averaged. As shown in Figure 4 the contract selection model, ten sub-criteria were chosen for level (3).

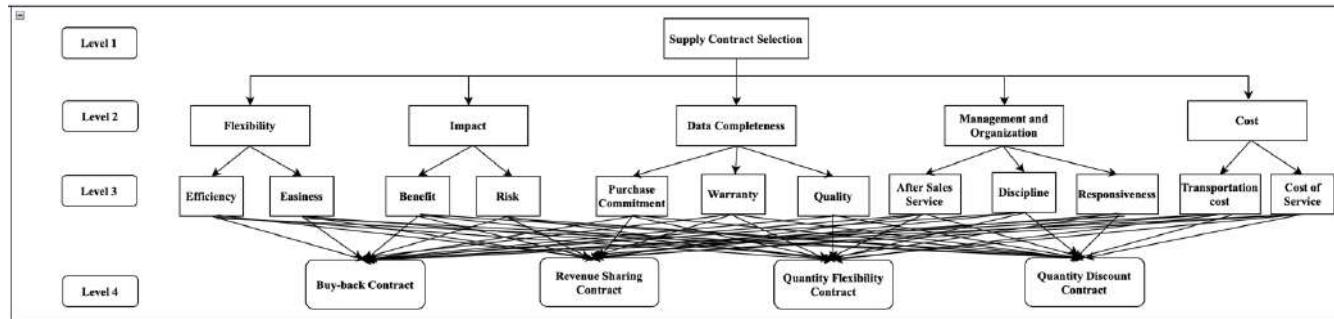


Fig. 4. An Illustrative Decision Hierarchy for Contract Selection

Source : Author

Based on Fig.4 the author illustrates an example four level hierarchy for the contract selection problem. To select the contract for Al-Ikhlas Farm, the first level of the hierarchy is Cost, Flexibility, Data Completeness, Impact, and Management and Organization, which are included in the second level (criteria). The third level contains sub-criteria which are Efficiency, easiness, benefit, risk, etc. The lowest level of the hierarchy contains the supply contract type namely various contracts to be evaluated to select the supply contract.

C. Construct a Set of Pairwise of Comparison Matrix

In level two, the pair-wise comparison judgments were used to identify the important criteria. This method has proven to be very effective in data collection. The pair-wise comparisons function by determining the relative importance of the criteria and sub-criteria, which is rated using Saaty's (1980) in Alsuwehri [20] nine-point scale, as shown in Table 3, indicating the level of relative importance from equal, moderate, strong, very strong, to extreme by 1, 3, 5, 7, and 9, respectively. The numbers 2, 4, 6, and 8 represented the intermediate values between two adjacent arguments.

Table 1 - MEASUREMENT SCALE

Source: Saaty (1980)

Verbal Judgment or Preference	Numerical Rating
Extremely Preferred	9
Very Strongly Preferred	7
Strongly Preferred	5
Moderately Preferred	3
Equally Preferred	1
Intermediate values between two adjacent judgments (when compromise is needed)	2, 4, 6 and 8

The survey was carried out by interviewing subject matter experts in the form of an interview to explain the numerical rating scale and the criterion for the judgments.

Based on the initial interview with the owner of the farm and direct observation by the author, we found that only three experts that compatible with this interview. The following is the outcome of three expert interviews:

Table 2 - EVALUATOR LIST

Name	Numerical Rating
Hen	Supervisor
Fauzan	Inventory and Warehousing Manager
Zil	Owner

Based on the results of discussions with the owner, three compatible experts were chosen to be experts in contract selection interviews for the supply chain contract selection process at Al-Ikhlas farm. This selection was based on educational background, position, and experience of experts in egg distribution at the company. Expert Hen was chosen based on his 17-year experience as a farm supervisor in charge of managing the purchasing and selling of eggs, as well as serve as a liaison between the retailer and the owner. Expert Fauzan was chosen based on his 8-year experience managing warehouses and monitoring eggs in and out. and the owner was chosen because the Al-Ikhlas farm owner operates as a retailer locator and determines the pricing of eggs every day.

D. Determining Weight for Each Criteria

The weight of each criterion was determined through pairwise comparison using AHP methodology. A questionnaire was used to perform a pairwise comparison.

The respondents held the positions of supervisor, inventory and warehouse manager, and owner. The questionnaire results were then entered into the Expert Choice 11 program.



Fig. 2. Ranking on Type of Supply Contract Selection

Source : Author

The inconsistency is 0,05. It signifies that the data is correct because the inconsistency is less than 1. There are three evaluator to select the best contract for supply contract selection. Figure 3 can be seen inconsistency each evaluator.

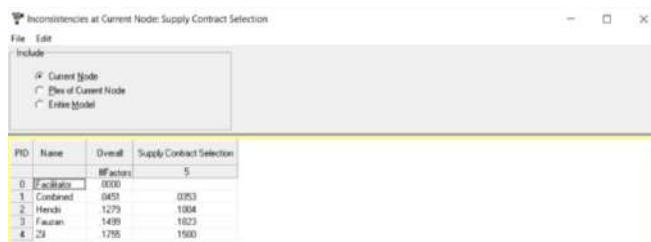


Fig. 3. Ranking on Type of Supply Contract Selection

Source : Author

The inconsistency is 0,0451. It signifies that the data is correct because the inconsistency is less than 1. Table 3 shows the global weighted score with their scoring.

Table 5 - GLOBAL WEIGHTED SCORE WITH SCORING

Source: Author

No	Criteria	Local Weight	Sub-criteria	Local Weight	Global Weight
1	Flexibility	0,422	Efficiency Easiness	0,797 0,203	0,0
2	Impact	0,122	Risk	0,799	
			Benefit	0,201	0,025
3	Data Completeness	0,134	Purchase commitment	0,492	0,066
			Warranty	0,344	0,046
			Quality	0,163	0,022
4	Management and Organization	0,151	Responsiveness	0,492	0,074
			Discipline	0,251	0,038
			After sales service	0,256	0,039
5	Cost	0,171	Transportation cost	0,84	0,144
			Cost of service	0,492	0,084

The ranking list of criteria shows that cost and flexibility factors are at the top of the list, with the top rank being efficiency (0.280) followed by percentage transportation cost (0.144), and risk (0,097) and purchase commitment in 7th position with percentage (0.066). Figure 3 can be seen AHP Final Result.

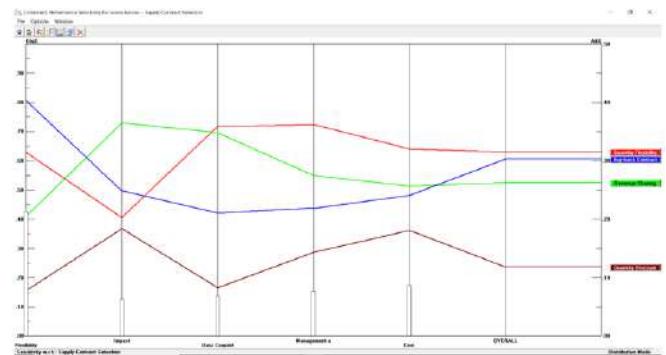


Fig. 4. AHP Final Result

Source : Author

The Analytic Hierarchy Process's goal is to choose the best supply contract options. The most significant influencing criteria are flexibility, and the appropriate supply contract option is the Quantity Flexibility Contract.

III. FINDING AND DISCUSSION

A. Quantity Flexibility Contract Implementation

Based on calculation before, the author will construct supply contract using quantity flexibility contract, which means commitments of both parties. These contracts are more successful than buyback contracts when the supplier sells to multiple retailers because they allow the seller to aggregate uncertainty across multiple retailers, decreasing the quantity of excess inventory. When properly implemented, quantity flexibility contracts increase the average amount purchased by retailers and may boost total supply chain profits. There are 8 step to implemented quantity flexibility contract

First. Define demand for product

Table 6 - DEMAND FOR EGGS DURING PREVIOUS SIX MONTHS

Source: Author

Type Size (pts)	Retailer A	Retailer B	Retailer C	Retailer D
11/21	152	58	28	158
12/21	153	57	69	112
01/22	132	46	71	19
02/22	132	46	71	19
03/22	152	54	30	110
04/22	133	48	86	111
05/22	148	49	15	25
05/22	158	57	21	8
Average	144,97	51,86	48,82	70,16
Stdev	10,95	5,15	27,79	58,44

Based on the demand data, and assuming that the demand data is normally distributed, the average retail demand is between 360 bonds/months.

Second, Define customer service level for each retailer

The Quantity Flexibility Contracts model for the Al-Ikhlas farm supply chain structure above shows that the farm produces eggs at the cost of v per bond and then sets the selling price to retail at c , then retails sell eggs to consumers at market prices. Farm set a manufacturing cost (v) of Rp. 330.000,- per bond, with a sale price to retailer (c) of Rp 335.000- Rp.350.000,- per bond. Additionally, Retail offers eggs to customers (p) for Rp.660.000,-. If there is an excess product at the conclusion of the selling period, it is presumed that it has no residual value under this system. () and () are assumed to have the same value. (Retailer A)

$$\begin{aligned} \text{CSL} &= \frac{p-c}{p} & (1) \\ \text{CSL} &= \frac{660.000 - 335.000}{660.000} \\ \text{CSL} &= 0,34 \end{aligned}$$

Based on calculation, customer service level from Retailer A around 34%.

Third, Define number of retail order

If known demand is normally distributed with the average , standard deviation and the CSL value, then the optimal number of orders can be calculated using the formula: (retailer A)

$$\begin{aligned} O &= F^{-1}(\text{CSL}; \mu; \sigma) & (2) \\ O &= F^{-1}(0,34; 144,97; 10,95) \\ O &= 137 \text{ bond} \end{aligned}$$

From the calculation, number of order from retailer A equal to 137 bonds.

Fourth, Calculate the Number of Expected Purchases by the Retailer Q_R

If there are excess products at the end of the selling period, it is assumed that products do not have a residual value under this system. and value is expected to be the same.

The number of expected purchases by retailer that =0,2 equals, (retailer A)

$$\begin{aligned} Q_R &= qF(q) + Q [1 - F(Q)] + \mu \left[F_s\left(\frac{q-\mu}{\sigma}\right) - F_s\left(\frac{q+\mu}{\sigma}\right) \right] - \\ &\quad \sigma \left[f_s\left(\frac{q-\mu}{\sigma}\right) - f_s\left(\frac{q+\mu}{\sigma}\right) \right] \end{aligned} \quad (3)$$

$$\begin{aligned} Q_R &= 118 * 0,02 + 176 [1 - 0,2] + \left[F_s\left(\frac{176-144,97}{10,95}\right) - \right. \\ &\quad \left. F_s\left(\frac{118-144,97}{10,95}\right) \right] - \sigma \left[f_s\left(\frac{176-144,97}{10,95}\right) - f_s\left(\frac{118-144,97}{10,95}\right) \right] \\ Q_R &= 145 \text{ bond} \end{aligned}$$

Based on equation (3) the author can conclude that for =0,2 and $c=435.000$ for expected quantity purchased by Retailer A around 145 bond.

Table 7 shows the complete findings for each retailer's calculation.

Fifth, Calculate Expected Quantity Sold by Retailer D_R

$$\begin{aligned} D_R &= Q [1 - F(Q)] + \mu F_s\left(\frac{q-\mu}{\sigma}\right) - \mu f_s\left(\frac{q+\mu}{\sigma}\right) & (4) \\ D_R &= 176 [1 - 0,2] + 144,97 F_s\left(\frac{176-144,97}{10,95}\right) - \\ &\quad 144,97 f_s\left(\frac{118-144,97}{10,95}\right) \\ D_R &= 138 \text{ bond} \end{aligned}$$

Based on equation (4) the author can conclude that for =0,2 and $c=435.000$ for expected quantity sold by Retailer A around 138 bond.

Sixth, Calculate the Expected Profit for Retailer (Retailer A)

$$\begin{aligned} \text{Expected Retailer Profit} &= D_R \times p + (Q_R - D_R)S_R - \\ &\quad Q_R \times c \end{aligned} \quad (5)$$

$S_R=0$ because the author assumed in this research that there is no item left in retail.

Expected Retailer Profit

$$\begin{aligned} &= 138 \times 660.000 - 145 \times 335.000 \\ &= \text{Rp. } 28.005.000,- \end{aligned}$$

Seventh, Calculate Expected Profit for Manufacture (Retailer A)

$$\begin{aligned} \text{Expected Manuf Profit} &= Q_R \times c + (Q - Q_R)S_M - Q \times v \\ & \quad (6) \end{aligned}$$

$S_M=0$ because the author assumed in this research that there is no item left in manufacture.

Expected Manufacture Profit

$$\begin{aligned} &= 145 \times 335.000 - 176 \times 303.000 \\ &= \text{Rp. } 9.624.226,- \end{aligned}$$

Eight. Calculate Supply Chain Profit

Last the author can calculate expected supply chain profit based on retailer profit and manufacture profit, the number of expected supply chain profit equals,

$$\begin{aligned}
 \text{Expected SC Profit} &= \text{Manufacture Profit} + \\
 &\quad \text{Supplier Profit.} \quad (7) \\
 \text{Expected SC Profit} &= \text{Rp. 9.624.226,-} + \\
 &\quad \text{Rp. 28.005.000,-} \\
 &= \text{Rp. 27.629.226,-}
 \end{aligned}$$

Table 7 - PROFIT CALCULATIONS USING QUANTITY FLEXIBILITY CONTRACT FOR RETAILER A

Source : Author

Retailer A												
alpha	Beta	c	o	Q	q	Expected Quantity Purchased by retailer	Expected Quantity Sold by retailer	Expected overstock at retailer	Expected Retailer Profit	Expected Manufactured Profit		Expected SC profit
0,1	0,1	Rp 435.000	142	157	128	119	112	7	Rp 22.056.223	Rp 4.433.593	Rp	26.489.816
0,2	0,2	Rp 435.000	147	176	118	145	138	7	Rp 28.005.000	Rp 9.624.226	Rp	37.629.226
0,3	0,3	Rp 435.000	152	197	106	138	127	11	Rp 23.695.116	Rp 318.828	Rp	24.013.943
0,4	0,4	Rp 435.000	157	220	94	165	160	5	Rp 33.825.000	Rp 5.106.322	Rp	38.931.322
0,5	0,5	Rp 435.000	164	246	82	123	118	5	Rp 24.435.555	-Rp 20.977.503	Rp	3.458.052
0,6	0,6	Rp 435.000	174	279	70	112	105	7	Rp 20.775.102	-Rp 35.972.310	-Rp	15.197.208
0,1	0,1	Rp 478.500	139	153	125	117	115	2	Rp 25.005.000	Rp 4.523.896	Rp	29.528.896
0,2	0,2	Rp 478.500	144	173	115	136	129	7	Rp 25.980.000	Rp 6.833.703	Rp	32.813.703
0,3	0,3	Rp 478.500	149	193	104	128	120	8	Rp 23.520.000	-Rp 2.861.185	Rp	20.658.815
0,4	0,4	Rp 478.500	154	215	92	152	118	34	Rp 11.760.000	Rp 976.987	Rp	12.736.987
0,5	0,5	Rp 478.500	159	239	80	178	116	62	-Rp 870.000	Rp 5.070.901	Rp	4.200.901
0,6	0,6	Rp 478.500	167	267	67	181	111	70	-Rp 5.475.000	-Rp 2.027.331	-Rp	7.502.331

The author shows the impact of different quantity flexibility contracts on profitability for the eggs supply chain on retailer A in Table 5. The author assume that () and () are the same because if there is an excess of products at the end of the period, it is assumed that there is no residual value, because probability = a / b + CSL is used in the calculations, calculations a and b in retailer A are restricted to a value of 0.6.

When demand is normally distributed, with a mean of 145 and a standard deviation of 19. The author assumes calculations on a wholesale price of c=Rp. 435000 and a retail price of p=Rp. 660.000. All contracts under consideration are such that a = b. From the calculation, the author can conclude that ()and ()=0,4 will give the highest expected supply chain profit, equals to Rp.48.021.322,-. When ()and ()=0,4 and c=Rp.435.000,-, retailer profits are maximized for an order size O=157 bond. For this order size, the author obtain a farm commitment to deliver up to Q = 220 bond and a Retailer A commitment to buy at least q=94 bond. In author analysis, the author assume that farm produce Q=220 bonds and sends the precise number (between 94 and 190) demanded by retailer. For this contract Such a policy results in retailer profits of Rp.33,825.000, - and farm profit of Rp. 14.196.322, -

framework [21]. Investigated ranking by sensitivity and discovered that tiny adjustments in the weight of criterion can affect the final ranking. As a result, it is critical to analyze the ranking's robustness. In this study, robustness was investigated by doing a sensitivity analysis on the final ranking of several supply chain contracts. Flexibility factors had the highest relative weight among the five assessment criteria in this study[22].

The weights of supply chain contract types have changed as the weights of assessment criteria have changed, as shown in Table. 4. Although the order of options stays same, the relative weights have shifted. It is obvious that when the weight of flexibility criteria increases, so do the weights of quantity flexibility type of supply chain contract.

B. Sensitivity Analysis

The author considers the sensitivity of the final ranking of the alternatives to changes in the weights of the objectives at the first level of the decision hierarchy within the AHP

Table 8 - PERFORMANCE SENSITIVITY ANALYSIS CONTRACT SELECTION AFTER
CHANGE THE SCORE OF FLEXIBILITY CRITERIA

Flexibility Criteria	Contract Rating
0,422	Quantity Flexibility>Buy-back>Revenue sharing>Quantity discount
0,01	Quantity Flexibility>Revenue sharing > Buy-back >Quantity discount
0,02	Quantity Flexibility>Revenue sharing > Buy-back >Quantity discount
0,1	Quantity Flexibility>Revenue sharing > Buy-back >Quantity discount
0,2	Quantity Flexibility>Revenue sharing > Buy-back >Quantity discount
0,3	Quantity Flexibility>Buy-back>Revenue sharing>Quantity discount
0,4	Quantity Flexibility>Buy-back>Revenue sharing>Quantity discount
0,5	Quantity Flexibility>Buy-back>Revenue sharing>Quantity discount
0,6	Quantity Flexibility>Buy-back>Revenue sharing>Quantity discount
0,7	Buy-back>Quantity Flexibility>Revenue sharing>Quantity discount
0,8	Buy-back>Quantity Flexibility>Revenue sharing>Quantity discount
0,9	Buy-back>Quantity Flexibility>Revenue sharing>Quantity discount

It shows in Table 3.8 that whether the flexibility criterion, which is 42,2%, is reduced to 1% or increased to 60%, the contract supply chain's ranking does not change. However, if the value of flexibility is increased from 70% to 90%, the contract supply chain will be ranked as follows: buyback contract, quantity flexibility, revenue sharing, and quantity discount.

IV. CONCLUSION

A. Conclusion

This research was conducted at Al-Ikhlas Farm to choose the appropriate contract that can solve the problem at farm. In doing this, the author developed a quantity flexibility contract that consist of defining decision rights, proc, minimum purchase commitments, quantity flexibility, buyback or return policy, allocation rules, and lead time. Furthermore, the primary discovery from this research will be elaborated and discussed by answering each of research question which is proposed at the beginning of this research.

RQ 1 : What are the root causes of reservation time fluctuation between each supplier at Al-Ikhlas Farm?

As mentioned in the beginning, Al-Ikhlas Farm faced problem fluctuation of retrieval time with four retailer. Based on current reality tree, it could be concluded that the root cause of the problem are lack of a contract supply chain between the owner and the retailer and a lack of employee capabilities. because Al-Ikhlas farm is already joined with third party to develop a clear and structured job desc, job spec, and training program, the author focus on the first root cause.

RQ 2 : What is the most suitable solution for these root causes?,

Based on calculation using analytical hierarchy process, decreasing reservation time fluctuation of eggs is to gradually apply quantity flexibility contract between farm and retailer at Al-Ikhlas Farm. Based on Emmon and Gilbert [22], In this case, we analyze the quantity flexibility contract. We show that the retail price that maximizes predicted retailer profits is greater than the price that maximizes profits if demand were constant. We then show that if the wholesale price is within a given range, the manufacturer would prefer a positive buyback fraction. In comparison, this choice is preferable than not signing into a quantity flexibility contract at all. Finally, in the scenario of price dependent demand, we demonstrate that the contract results in a win-win situation for both the producer and the store.

RQ 3 : How much supply chain profit is earned as a result of suitable solution?

Based on calculation using quantity flexibility contract that apply for four retailer in Al-Ikhlas Farm set a maximum and minimum limit for egg retrieval by Retailer A,B,C,D, ensuring that eggs are distributed consistently to each retailer. This will have an effect on the consistency of egg sales to each retailer, requiring the farm to measure egg output every month. The implementation of quantity flexibility contract will enhance the supply chain profit equals to Rp. Rp48.021.322,- for Retailer A, Rp.17.669.702,- for Retailer B, Rp. 26.403.667,- for Retailer C and Rp.44.379.203,- for Retailer D. Therefore, quantity flexibility contract is beneficial for Al-Ikhlas Farm because the contract will make sure egg sales for each retailer.

B. Implication and Future Research

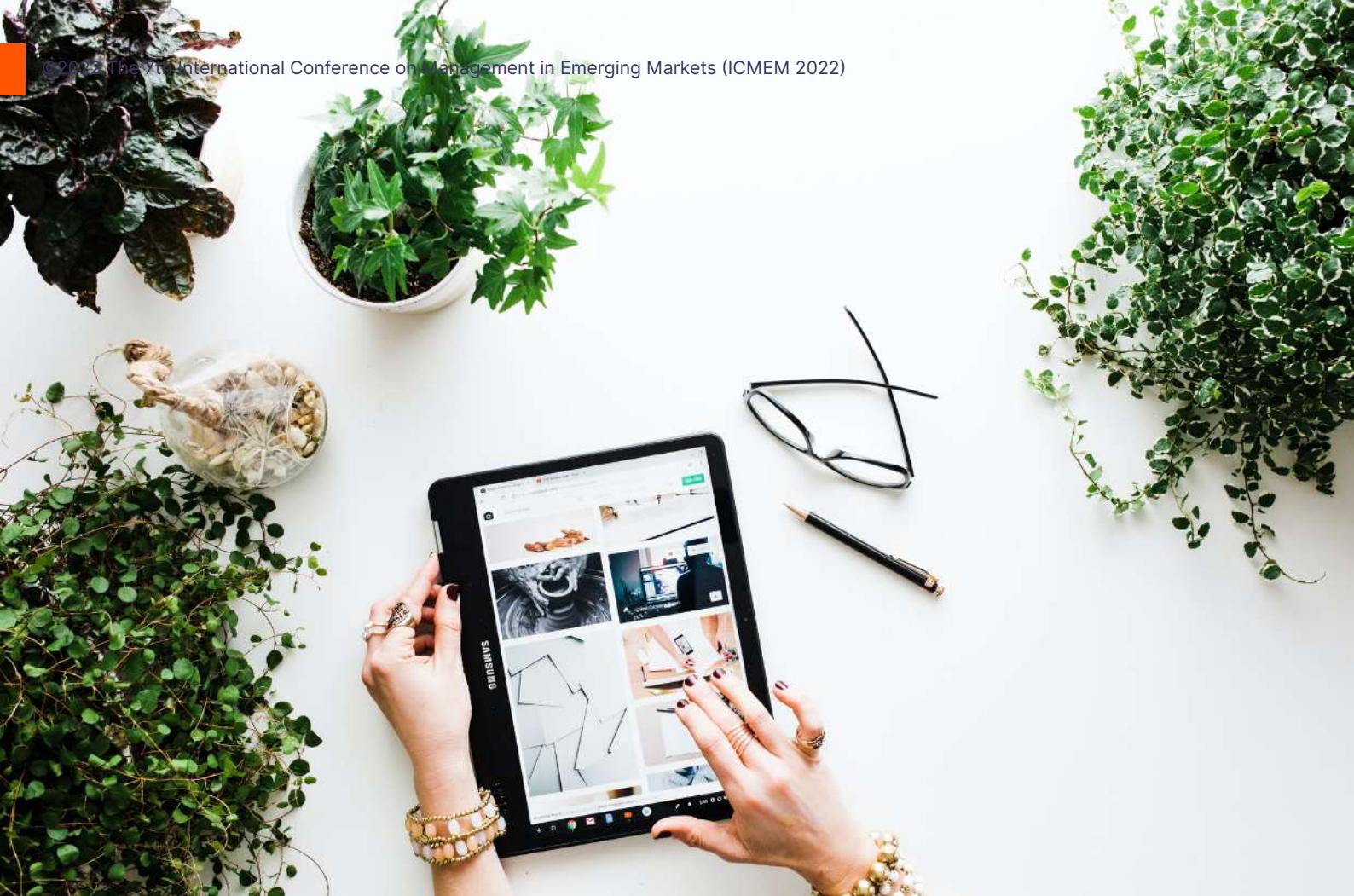
The implication of supply contract could be beneficial for another poultry farm with adjustment and justification.

For future research, another author can more selection

criteria for supply chain contract assessment can be explored in the future, doing research regarding supply contract Al-Ikhlas's other product such as laying hen, chick, and in the future, the author can focus to implement the supply contract with monitoring the contract offering procedure till the contract is formed with the approval of both sides.

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Paper 54

Business Process Improvement Strategy in Company
Digital Channel Official Store in the Marketplace for
Company Sustainability

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - Digital transformation is begun to emerge sharply as the pandemics starts in the beginning of year 2020 and become the silver lining strategy for many companies which as a result in leveraging online channel. In cement industry, online channel is bringing the decommoditization program to the company products by created added value such as transparency, easy to access, and competitive price as the result in leveraging technology will increase company efficiency and lowering distribution cost. This research is focused on improving the existing business process of the company online channel in the official store in the marketplace and implementing using the Deming circle frameworks. There are two business process improvement plans exercised consist of lowering the minimum order quantity and implementing new direct selling business scheme by leveraging company distribution center. The direct selling scheme are expected to give some added margin because of the shorter supply chain and lower distribution cost while lowering the minimum order quantity are addressing to increase sales by tapping into other market segments. The main objectives are to presume that developing online channel will not jeopardize the offline channel and will bring impact in company business sustainability in the future.

Keywords - business process, online channel, continuous improvement, lower distribution cost, added margin, revenue, official store, business sustainability

I. INTRODUCTION

According to Indonesia Cement Association data, total cement industry growth for domestic and export are increased by 7% or 76 million YoY in 2021. Domestic sales growth of Indonesia cement market in 2021 are at 4,3% YoY while the overcapacity is still occurred as in the same year the domestic capacity is increase at 120 million ton.

PT Multi Orchid Nusantara or called as PT. MON was one of the big cement companies in Indonesia. As a holding company, PT. MON gave an autonomy to its subsidiaries company in service business line. However, for the cement producer operating company PT. MON made a policy and blueprint for the organization structure. Commercial activities managed by PT. MON are emphasizing in business development, sales, supply chain, and marketing for all product brand within the company group. Cement industry are one of the sectors affected as construction

sectors are hit hardest also during the pandemics. There are two market section in PT. MON for selling their cement products consist of corporate sales and retail markets section. Overcoming the challenge arise amidst the pandemic the company had constructed and formulated the strategy to survive by shifting or expanding through new sales channel (digital marketplace) or so-called official store for the retail markets section. Company official store has been established since the last quarter of 2020 and keep growing until 2021. Considering expanding the official store in the digital marketplace PT. MON then decided to change the strategy in manage the digital channel. Company management then decided that one of the subsidiaries PT. Surya Indra Sentosa (PT. SIS) will be manage as the official store operator after thorough evaluations.

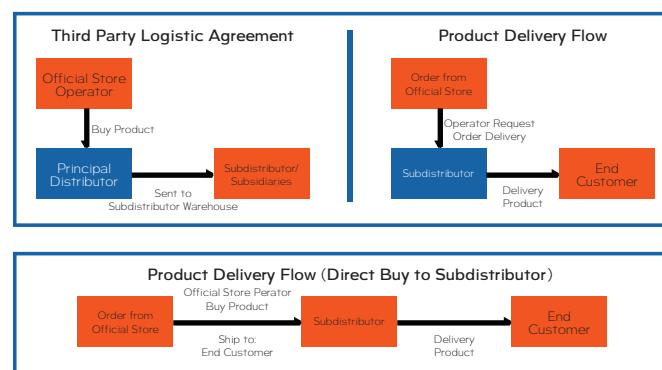


Figure 1. Official Store Business Process

Digital business and transaction in Indonesia throughout 2021 are increases noting the building material and infrastructure sectors. The arguments of potential growth in retail markets of building materials strongly supported by the analytical data generated by the Indonesia Central Bank forecast for E-Commerce growth at 31,2% in 2022. The bag segments which attributes to retail segments like building house and renovations are still contributing the largest volume in domestic demands compare to other segments. According to Indonesian ministry of industry the consumption volume in bag segments is more than 70% both inside and outside java island compared to bulk segment which attributes to infrastructure needed. There are some improvements that could be exercise by PT. Multi Orchid Nusantara strategy regarding opening the official store or online channel to distribute the product in the marketplace. Developing the digital channel could resulting in generating new competitive advantages for

the company that possibly transforms in sustainable competitive advantages. For instance, by implementing the online channel with the direct selling scheme through distribution center the company could generate competitive retail price while increasing the profit margin.

Other examples are company official channel should be able to be tapping in the potential market which rarely addressed by offline channel by providing added value service in delivery the products. As the competition will likely shifted into digital channel in the future mentioning the pandemics are promoting the digital transformation process to become faster. The company knowledge, preparation, and experience are very important to overcome future competition in the online channel. There were some insight and knowledge might be resulted in the process that enrich the company knowledge and competitive advantages.

II. METHODOLOGY

Implementing business improvement should be a sustainable process to obtain the continuous growth which further result in sustainable competitive advantages. There were many tools could be used to implementing such strategy for instance the generally known tools use are PDCA (Plan Do Check Act) frameworks or known as Deming circle. These tools are an iterative design and management methods to control business process while at the same time focusing on continuous improvement process. Even though basically these methods are come from the quality control methods it is also widely used as strategic learning process frame. The circle goes round, and round and the repeated iterative process will make the knowledge getting richer. The methodology used by in this research are combination of both qualitative and quantitative methods which are commonly used for the research. There are three variables in this research consist of :

A. Business Process

Developing the digital channel could resulting in generating new competitive advantages for the company that possibly transforms in sustainable competitive advantages. The improvement to operation format or existing business process should be exercised in order to gain more margin or profit for the company sustainability in the future. Company should be able to create competitive advantages, increase efficiency, and value added by optimization of the business process. With the current business process, margin or profit generated are in 1,5% – 3% of GMV or relatively similar with the traditional channel.

On the other hand, the bag segments which attributes to retail segments like building house and renovations are

still contributing the largest volume in domestic demands compare to other segments (more than 70% both inside and outside java island compared to bulk segment) which attributes to infrastructure needed. In the side of digital business growth, Indonesia E-Commerce growth in 2021 are 50,8% and forecasted to keep growing at 31,2% in 2022 (BI Indonesia Economic Report, 2021: 60) which emphasizing that the company should seize the opportunity to improve the business process for business sustainability. Then, there are several options or alternatives business process improvement could be exercise for instance lower distribution cost or lean and optimum cost structure by implementing new business process scheme with shorter supply chain by utilize the distributor center of the company.

B. Daily Operational

There are three main issues from that might results in low sales or revenue in company digital channel from the daily operational sides. First are the customers awareness about the company official stores. Low level of awareness will affecting directly to official store traffic and revenues. Second issue are regarding the financing options and competitive price offered by the digital channel or official store. Company should be able to generate competitive price as one of the important value added in utilizing digital channel. Then the next issues are company service level in delivering the product or minimum order quantity that should be aligned with the customer segment needs in which in the current segments are majorly medium level contractor and homeowner of big house. However retail segments are consist of not only medium contractor but also small contractor, homeowner that conducting house renovation, and many more. If the services are not aligned with these customers, they buy the product directly to the offline shop become the preferred options for the customers. Official store positioning should be clear and aligned with the targeted customers.

The company should address and improve daily operational as several issues could be arises with the current service level like whether it is synchronized with the existing loyal customers or the effectiveness of the existing digital marketing campaign and programs which could be shown from the conversion rate or customer engagement. Lowering the minimum order quantity will become an alternatives in improve the daily operation service provides to improves sales even though several aspect should be exercise first.

C. Customers or External Parties

Customer reviews and experience are important to improve the company official store therefore the questionnaires survey use by the marketplace platform

and the interview that is conducted are very important as the purposes are to get some insight on improving the existing official store services. Hence some external tools could be also exercised to enrich the evaluations about macro conditions of the competition mentioning PESTEL and 5-porter forces analysis frameworks.

Some in depth interview are conducted from October 2021 until March 2022 to gain insight and management view regarding the online channel development of the company despite the yearly evaluation performance data from company internal file. From the external side the research will emphasize the customers point of view regarding the company official store. There are

two categories of external customers from company point of view consist of end customer (homeowner) and builder workers (mason, overseer, and contractors). It is important to getting insight from the builder workers as they are play an important role in deciding the decision to buying the products based on the company internal research. On the other hand, the internal interview will be gathering more from company managers about company official store and development plan. Below are the detail of the interview respondent which consist of external parties like builder workers and company official store loyal customer and from internal parties such as managers from sales and marketing teams.

Table 1. Data Collection Methods

External Parties	Research Method	Details
Builder Workers	Qualitative Method (In-depth Interview)	Research Objectives: <ul style="list-style-type: none"> - To determine gain & pain points of builders material workers shifting to digital channel - To determine digital behaviour of builders material workers Samples : 50 participants (DKI, Banten, Jabar, Jateng, Jatim, and DIY) consists of : Mason (14), Overseer (14), Contractors (14), Architects (4) & Interior designers (4)
End Customer	Qualitative metod (In-depth Interview)	Research objectives: <ul style="list-style-type: none"> - To determine satisfaction level of official store operational performance - To gain insight and suggestion of official store customer for improvement Samples : 7-10 participants (in Jabodetabek) consists of Official Store loyal customers
Online Survey	Summary of buyers review and comments in marketplace	Research objectives: <ul style="list-style-type: none"> - To determine satisfaction level of official store operational performance - To gain insight and suggestion of official store customer for improvement Samples : 30 customers reviews (in Jabodetabek) from the past 6 months
Internal Parties		
Company Managers	Qualitative metod (In-depth Interview)	Research objectives: <ul style="list-style-type: none"> - To determine satisfaction level of official store operational performance - To gain insight and suggestion of management for improving business model operation - To determine digital channel plan and strategy of management Samples : 4 managers consists of sales, marketing and supply chain department

(Source : Author, 2022)

After collecting the data and exercising both internal and external analysis the root cause analysis then will be conducted. There are several aspects to be analyze including pricing, service level, margin, market penetration and market development. As purposes for the analysis are to generate more revenue (GMV) and meet customer expectation (added product features values) and create new business process to gain more revenue and margin for the company sustainable in the future by generate competitive prices to end customer.

III. RESULTS

Digital business growth sharp as the silver lining strategy for many industries to survive especially retails and FMCG (Fast Moving Consumer Goods) markets. The digital business or channel are important to address for the company as utilizing digital channel will increasing company supply chain network cost efficiency which affected the product price. Official store become one of the value-differentiation strategies adopted by the company as in 2020 are the only official store available

for buying cement product in the marketplace. Formulating the business solutions after exercising the root cause problem there are three factors should be addressed in differentiation strategy according to Rothaermel consist of (Strategic Management, 2021: 201) product features, customer service and compliment. There were some room to growth for the company to obtain the optimum performance is considering the official store only one years old. Below are the table that shown the results and conclusion after collecting the data both internal and external parties.

Table 2. Interview and Survey Resume

External Parties	Interview of Survey Resume
Builder Workers	Majority of mason, overseer, and contractors are attracted to buy cement online if : Price is cheaper than offline, delivered in same day and/or next day from nearest store or distributor, no minimum order quantity , COD/credit option, delivery track, and access through mobile app
End Customer	Most of the company official store customers are medium level contractors or homeowners who had big projects and used to leveraging online channel or marketplace. Reason to buy online because of cheaper price (promo), simple (don't have to go to the shop), delivery speed, and transparency. Overall, the customers are satisfied with the official store service even though there are some suggestion addressing in minimum order quantity (below 2-ton), credit payment options, promo or cashback and delivery service (material and service handling from expediteds)
Online Survey	Customer are very satisfied with company official stores performance in the marketplace. However, there are some suggestions and improvement for company official store daily operation which emphasizing in service (minimum quantity), quality (material handling), delivery (delivery time), and price (retail price & discount) .
Internal Parties	
Company Managers	All of respondent see digital transformation or utilizing online channel has a big and positive impact for the company sustainability in the future . However, there are some improvement need to be addressed by the company such as : <ul style="list-style-type: none"> - Added value (speed, transparency, cheaper price or de-commoditization, marketing campaign) - Change management & culture (digital behavior) - Market segmentation (potential market, service level improvement) - Margin (low contribution) - Fundamental (data integration with offline channel)
Internal Company Report Evaluation	- Total product seen in the last 3 months (Dec '21 – Feb '22) are 7,665 with 1.15% conversion rate . Average all sectors conversion rate in the ecommerce are 1.7% - 2% in 2021 (irp.com) <ul style="list-style-type: none"> - Total GMV growth in 2021 are 224% (YoY). With the current business model, margin or profit generated are in 1.5% – 2% of GMV

(Source : Author, 2022)

Business process improvement approach should be done by exercise the existing added value of company official store first. Purposes are to align such strategy or business process improvement with the existing added values perceived by the end customers to obtain and decided the targeted benefit or value added. Considering those three-differentiation strategy the business solution offered for the company should be able to solve two problems. First is by create new business process to gain more margin for the company sustainable in the future and generate competitive prices to end customer. And the last are improving daily operation to generate more revenue (Gross Merchandise Value) and meet customer expectation or added product features values.

Current business scheme for the company official store is consist of two business process scheme which are the direct buy scheme and third-party logistic scheme. As the third-party logistic business scheme is still not operated by the company as the ongoing administration proses the official store daily operational are using the direct scheme buy. Those two business schemes are inseparable as the main business process scheme basically are the third-party logistic business process. The direct buy scheme basically is the optional scheme to make the main business process more flexible in addressing the service level of the official store.

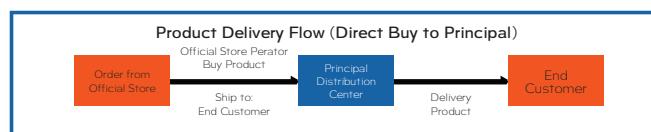


Figure 2. Official Store Direct Selling Scheme through Distribution Centre

Company infrastructure and facility across nationwide are one the company strong positioning and advantages that should be utilized. Mentioning there are total 5 company distribution center across nation which has the capability in distributing of company products similar with the sub distributor capability. The utilization and the traffic of the facilities are low in some areas which could be uses as the development of online channel business scheme.

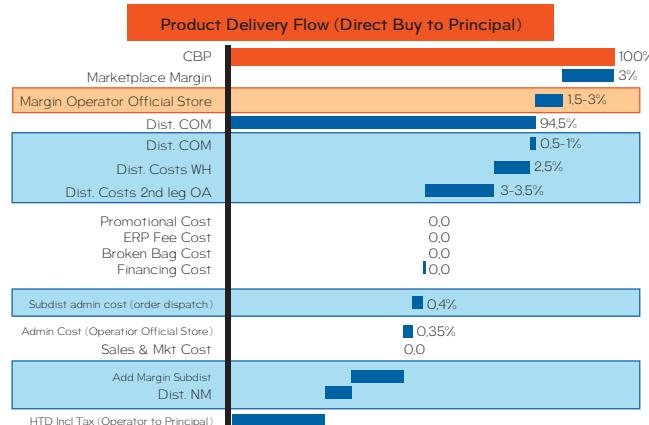


Figure 3. Price Waterfall Simulation (Direct Selling Scheme)

Using the direct selling scheme by utilizing the distributor center will cut several costs and resulting in generated more profit and margin for the company indirectly through the official store operator company. From the price waterfall evaluation which based on the company best practice cost structure data shown in the figure, the potential margin for the company which previously around 1.5 – 3 % will sharply increase and become around 12.5 – 14 % or four times higher. The price simulations give some real insight regarding the potential benefit from direct selling through distribution center scheme mentioning in lower supply chain network, higher margin, and lower distribution cost as a result.

Next business solutions propose for improving daily operation in generating more revenues and meet customer expectation are by lowering the minimum order quantity. Lowering the minimum order quantity will likely increase the sales or revenue as based on the interview there are many customers expected the services are provided. This strategy will be resulting in tapping into other customer segment of the retail markets which most likely are medium sized contractor and homeowner. There are four frameworks that leading to higher value creation between supplier and retailer consist of revenue margin enhancement, process improvement, cost reduction, sharing data, and ecosystem creation (Deloitte, 2017). Business process improvement approach should be done by exercising the existing added value of company official store first.

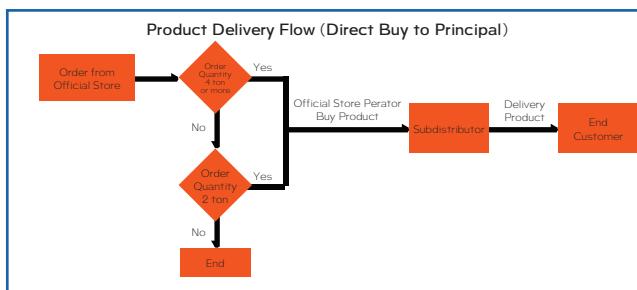


Figure 4. Order Flow Process after Lowering the Minimum Order Quantity

Lowering minimum order quantity will enhance the market penetration in the low numeric distribution area of company products as the distribution service and support are increased in the existing market. At the same time there are two potential market segments consist of contractor and homeowners that directly penetrated by such strategy and found out that the business improvement will support and facilitate their needs. As the result the number of company sales or revenue in the digital channel official will increase. However in deciding the number of the minimum quantity should be considered several factors including impacts on existing market, distribution cost and price optimization despite only mentioning in average customer consumption. It is important also to conduct

additional research in determining the market size of the low minimum order customer segment.

Planning sound and rigid strategy are important however the execution of the plan is the most critical moment in improvement step. With the execution of the plan many insights and facts will arise as the learning process occurs. Implementing the proposed business solutions, above table are shown the PDCA steps that should be exercised by the company. Improving business process should be based on the evaluation of every possible aspect and information that could be gathered. More comprehensive the data the more sound and exact strategy could be resulted to be implemented. In the first step of the PDCA framework, sound and extensive preparation or plan should be exercised first. Conducting new business process proposed as the business solution should be terminated if the evaluation or the plan preparation are inadequate. Nevertheless, the overall timeline to execute the project should be clearly defined and being prepared including the evaluation and continuous improvement phase.

Table 3. Implementation Phase of New Business Improvement Plan

Improvement Plan	Planning & Evaluation Phase	Execution Phase	Evaluation & Countermeasure Phase
Direct Selling Business Process Scheme through Distribution Centre	<ul style="list-style-type: none"> a.) Plan evaluation step which addressing some of the potential benefit from direct selling through distribution centre scheme b.) Evaluation for selecting the pilot project area based on brand or product availability, truck or logistic transportation availability, and others c.) Integration and evaluation of existing intercompany sales procedures and systems 	<ul style="list-style-type: none"> a.) Create a new standard operating procedure as the business process for direct selling to end customer scheme b.) Execute the plan, try to promote and build a collaboration with area sales manager 	<ul style="list-style-type: none"> a.) Evaluation of sales performance after 3 and 6 months. b.) Formulate the correction plan after evaluation process.
Lowering Minimum Order Quantity	<ul style="list-style-type: none"> a.) Selection of the pilot project area based on sales and marketing team recommendation. b.) Determine the new minimum order quantity (for instance the minimum order quantity at 2 ton) c.) Determine the service level considering utilization of vehicles. d.) Setting the new price for the additional services to the customers. 	<ul style="list-style-type: none"> a.) Make an agreement with partners regarding the new business process (pricing, service level agreement, transportation availability, and others) b.) Execute the plan and promote the services with marketing campaign 	<ul style="list-style-type: none"> c.) Execute the correction plan and make standardization for the improvement process

(Source : Author, 2022)

Decommoditization of the cement product is important to be and the company should answer such question by giving some value enhancement by leveraging the digital channel for instance not only in generating cheaper price to generates sales or revenue but also in increase awareness of the company digital channel. The value differentiation or value added for the product will bring a new game in the market despite relying on the price war which further could make the company loss their profits. Exercise the partnership model in certain pilot project area preferable to be exercised in the beginning as the foundation in developing the business process, business model and partnership in the future.

IV. DISCUSSION

As a result, in adding new services for lowering the minimum order quantity there are some additional costs should be addressed by the company. Additional cost that attributes to the customer supposedly as low as possible to retain the product competitive price. From the cost structure evaluation and benchmarking process the additional price that customer has to paid for delivering the 2-ton quantity order are around 3-5 % from the total transactions. The number are still allowable considering the marketplace or platform frequently gave some cashback or discount at 2-3 % almost in every month. Based on the available vehicle capacity or size in the markets there are 2,5-ton pick-up trucks that aligned and met with the customer needs. It is better for the company to execute the plan slowly and steadily. The value differentiation or value added for the product will bring a new game in the market despite relying on the price war which further could make the company loss their profits. Overall the several factors that might smaller the company profit should be considered by the company for instance the increment of marketplace platform fee and marketing programs expense which are needed to generate more sales for introducing new product or service in the future.

Total GMV growth in 2021 are 224% (YoY) however even though the performance is excellent there are several factors need to be addressed considering cement are seasonal or cyclical commodity product which depends on several factors including weathers conditions. The seasonal problem also affecting not only the demand but also the retail price of the product in the markets. Hence the company should exercise whether the performance of digital existing digital channel could overcome and become one of the alternatives in facing the seasonal problem which could generates more stable revenue throughout the years for the company. Because of the price are still considered as important factor for the consumer caused by the overcapacity in domestic markets the daily operation of the company should be able to generate competitive price. It is important to address

as digital channel are one of the tools to improve the operational efficiency of the company. Therefore, through the digital channel the company should be able to handle several issues regarding the efficiency which resulting in generating cheaper price and give some added value to the product to shift customer perception value of the commodity product like cement. Even though additional research are needed to evaluate the effectiveness of the existing digital marketing campaign and programs as the conversion rate or customer engagement in the digital channel are affected by many factors.

The proposed solutions then should be evaluated not only from the internal company sides but also from the external side. Developing online channel addressing the proposed solution in implementing the direct selling scheme are unfavorable for many cement makers as there were some consequences arise and should be managed by the company. Some have tried to sell through digital channel by developing the ecommerce websites, but the result is unsatisfied. However, there is one interesting fact that one competitor is success in developing digital channel in the marketplace similar with the company which others are emphasizing in developing the digital channel by creating the new ecommerce website. Developing digital channel in marketplace has several different challenges than the new ecommerce for instance in developing the ecommerce some huge amounts of money are needed to boost the website traffic and must compete with the marketplace traffic. Implementing the proposed business solution in company digital channel should be exercised with accommodate all the consequences which resulting in minimize the risk for the company. Other options or alternatives that are available and could be exercised by the company to implement such strategy are by partnering with local start-ups companies even though some thorough exercise are needed to evaluate the current and future partnerships and the business model.

Using PDCA methods might help in minimize the risks. After evaluation or formulating and decided several factors in the plan preparation step such as pilot project area, retail-based price, and market segmentation then the company official store should try to conduct the plan. There are several notables step that should be taken while implementing the business process improvement plan. One example to overcome the consequences mentioning by competitor are implementing the solution in pilot project area scheme in which the destined area had been evaluated by all teams including sales, supply chain, and marketing team. Implementing the business proposed solutions in the area which the company has the low numeric distribution of company product, low vehicle utilization, and vehicle capability are suitable place which bring more benefits than disadvantages consequences. The last step for the continuous improvement of business

process for the official store are relatively similar in the execution step. However, one thing that need to be emphasized in these steps are the standardization process of the business improvement. Standardization become a crucial and important factor while applying an iterative process to obtain the goals.

Last, without standardization mostly the direction of the improvement process will scatter and hardly hit in targeting the goals for the company official stores. Last thing should be addressed in implementing the continuous improvement are on how the company managed the knowledge regarding all the innovations that had been implemented before. Knowledge about managed online channel, online conversion rates, and digital marketing campaign are become one of the basic competences that will emerged and become a very important for the company in the future as by utilized such knowledge it will increase the opportunity that the new knowledge will become company new competitive advantages for business sustainability.

V. CONCLUSION

Developing the digital channel could resulting in generating new competitive advantages for the company that possibly transforms in sustainable competitive advantages. However, in developing the online channel the company should exercise continuous improvement process as in the digital or online channel agility are become an important tool to obtain success. There were some insight and knowledge might be resulted in the process that enrich the company knowledge and competitive advantages. For instance, by implementing the online channel with the direct selling scheme through distribution center the company could generate competitive retail price while increasing the profit margin. Such conditions exist caused by the lower distribution cost as the main impact in leveraging the online channel. It is also important to mention that the purposes of the company official channel are creating omni channel and tapping in the potential market which rarely addressed by offline channel for company business growth and sustainability. Therefore, the existence of online channel is important and the synergy or collaboration between online and offline channel should be managed well by the company.

Other options or alternatives that are available and could be exercised by the company to implement such strategy are by partnering with local start-ups companies which nowadays are quite flourish. Many start-ups company such as Go-Cement, Deliveree, or other logistic company could become a potential partners in boosting and developing the company digital channel. However, some thorough exercise are needed to evaluate the future partnerships

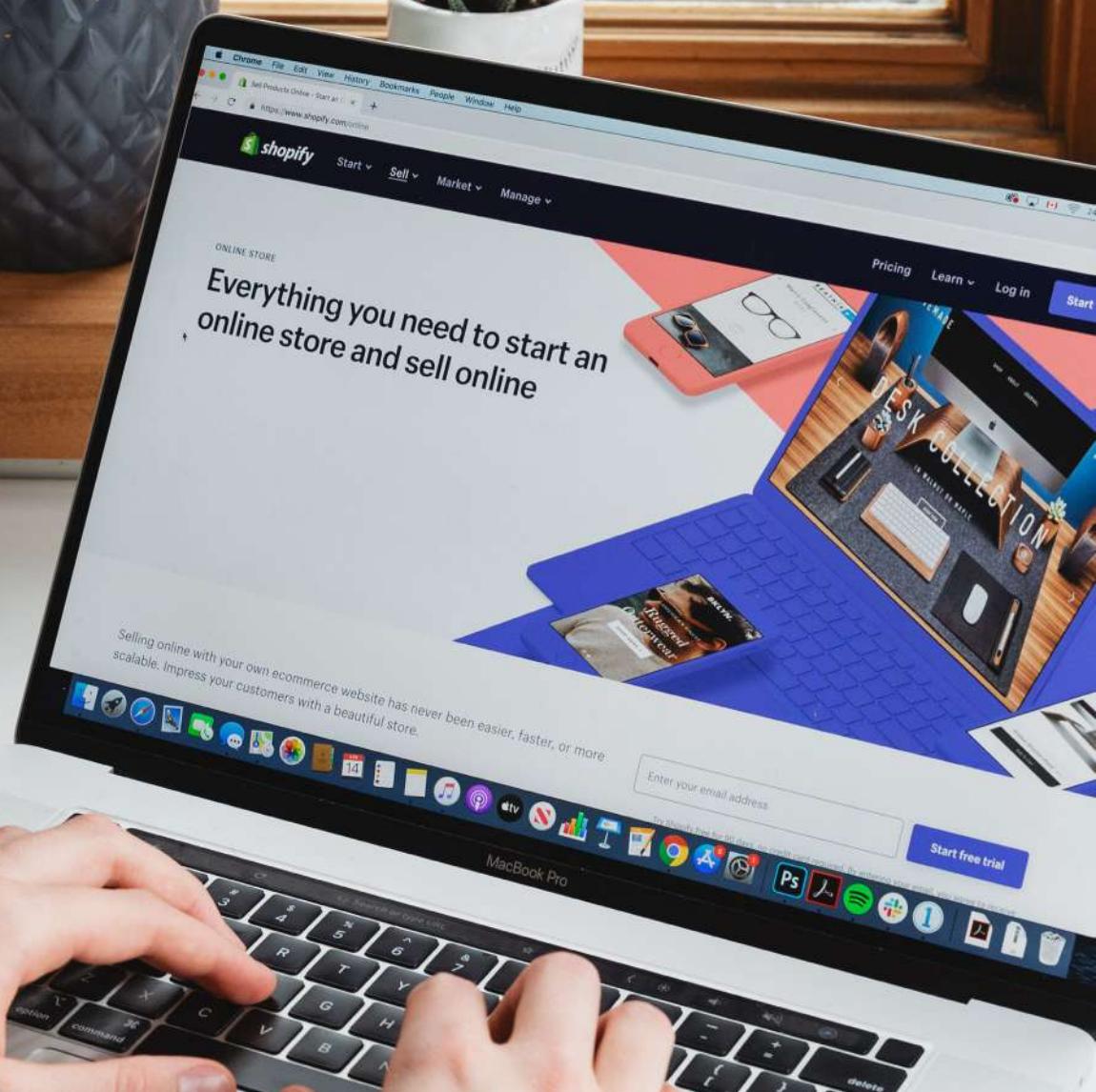
and business model in the digital channel. Exercise the partnership model in certain pilot project area preferable to be exercised in the beginning as the foundation in developing the business process, business model and partnership in the future.

Company strategy related to omni channel or marketing 4.0 will become a common thing to be adapt by the company and such knowledges should be maintained well for the company sustainability in the future. It became urgent to exercise the proposed solutions as the price war in the market become fiercer emphasizing in the pandemic's momentum in speed up the digital business. As the competition will likely shifted into digital channel in the future mentioning the pandemics are promoting the digital transformation process to become faster then the company knowledge, preparation, and experience are very important to overcome future competition in the online channel.

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Paper 55

Proposed Improvements in Queuing Process of Obstetric Gynecology Polyclinic Outpatient at RSIA BM

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - As one of the well-known women and children hospitals, RSIA BM already uses advanced technology in its queuing process compared to another hospital that is still using manual processes. However, there are operational issues related to the queuing process in the Obstetrics and Gynecology Polyclinic that triggered dissatisfaction and complaints from the outpatients. In this research, the researcher aims to determine the improvement suggestions in the queuing process by determining the key drivers of customer's satisfaction. The researcher used a qualitative method and conducted secondary data collection from previous studies. Based on the findings, the solutions recommended by the researcher to improve the outpatient queuing process and its technology are to provide clear information, actively follow up patients, and monitor the queuing waiting time.

Keywords - Customer Satisfaction, Queuing Process, Hospital Management, Outpatient, Online Reservation

I. INTRODUCTION

In Indonesia, the healthcare industry is a promising business because it keeps growing and expanding especially as the impact of the Covid 19 pandemic. In the pandemic situation, usually the customer with no symptoms of Covid-19 prefers to visit women and children hospital rather than the general hospital, because the women and children hospital did not accept Covid-19 infected patients. However, there are some market segments that still prefer to visit general hospitals and it becomes a challenge for women and children hospitals to maintain their quality and customer loyalty. RSIA BM has improved a lot since the beginning of their operation but there is still patient dissatisfaction which can make the hospital potentially lose the patient if the hospital did not do any improvement. The main problem faced by RSIA BM was many complaints from the outpatients as the impact of the existing queuing process. Currently, the patient can register themselves through the BM mobile application to book the desired check up schedule and to get the queuing number. When the patient arrives at the hospital on the selected date, they need to do self check in through a machine that is located in the lobby. If the patient arrives earlier or on time, they usually wait for 10 to 15 minutes before the consultation session. However, if the patient arrives late even by 1 second to reconfirm

their status on site, they will be moved to fulfill the next available consultation session and need to wait longer (usually waits for more than 60 minutes). This issue is impacting 70% from the overall offline visit. Wanhu Xie, Xiufeng Yang, Xiaojun Cao, and Peiyi Liu (2019) also stated that waiting time in outpatient clinics are regarded as substantial obstacles and need to be reduced. Therefore as one of the well known hospitals in Tangerang Selatan, Indonesia, RSIA BM has to maintain their patients' satisfaction and improve the queuing process, to increase the outpatient satisfaction. In this research, the researcher aims to propose improvements in the queuing process of obstetric gynecology polyclinic at RSIA BM.

II. METHODOLOGY

The research narrowed to find out 2 research questions as below:

1. What drives the customer's satisfaction?
2. How to improve the outpatient satisfaction related to the queuing process in the obstetric gynecology polyclinic at RSIA BM?

The objective of this research is to find out the customer satisfaction drivers related to the overall outpatient queuing process of the obstetric gynecology polyclinic in RSIA BM and to find out the suggestion to improve outpatient satisfaction related to the outpatient queuing process of obstetric gynecology polyclinic in RSIA BM.

The researcher gathers 2 main sources which are primary and secondary data. The primary data is collected through a qualitative method and the secondary data is collected from the previous studies. According to Creswell (2003) the researcher used a qualitative method because it will be more suitable and efficient to collect the reliable information from the relevant stakeholders. Qualitative method is also chosen because currently not much study has been written about this specific topic or the population being studied. The researcher will specifically use interviews data collection type considering the data availability and advantages. The interview is conducted to 9 respondents from 3 respective clusters (outpatient, doctor, and administrative team) To analyze the interview feedback from the respondents, the researcher is using mind mapping based on the theory of Johnny Saldana (2015) about the coding manual for qualitative researchers.

This research cannot be generalized because this research is conducted specifically for a selected industry, selected country, and selected hospital. The research is focused on the queuing operational management and did not cover the financial, expenditure, human resources management, or any other scope. The interview is conducted with selected respondents from the relevant stakeholder clusters and the feedback could be biased because the answer depends on the interviewees point of view. The information is also given in a designated condition not in the natural field setting. Each respondent also has different articulation and perspective.

III. RESULT

Based on the respondents feedback, the researcher found 41 keywords stated or interpreted by the respondents such as waiting time, mobile application system, provides clear information, bounced waiting line, on time schedule, sudden cancellation, queuing notification availability, actively follow up, hospital collaboration, self check in, insurance coverage, customer complaint trigger, call center contact point, walk in registration, technical difficulties, flexible appointment, pandemic safe area, hassle registration process, on site confirmation, realtime queuing number, outpatient preference, doctor's emergency situation, snowball effect queuing, spacious waiting room, loyalty, manual data completion, manageable schedule, online confirmation, differentiatie consultation session length, doctor's branding, first come first serve, new equipment or hospital, location movement, promotion, advanced equipment, provides comforting session, patient recommendation, feedback collection, costly registration, define clear SOP, and actively suggest next appointment.

In order to answer the research questions, the researcher used mind mapping analysis, fishbone diagram, and SWOT analysis to be able to find out the customer satisfaction drivers related to the overall outpatient queuing process of the obstetric gynecology polyclinic in RSIA BM and to give the suggestion to improve outpatient satisfaction related to the outpatient queuing process of obstetric gynecology polyclinic in RSIA BM.

The mind mapping analysis refers to Johnny Saldana (2015) and highlighted the top 10 factors which were mentioned frequently by the respondents. The number of keywords repetition that frequently mentioned by the respondents showed the importance of each statement or keyword as below:

Sub Sub-Category	Total	Total in %	Contribution	Contribution In %
Waiting Time	25	8%	8	89%
Mobile Application System	20	6%	9	100%
Provides Clear Information	18	6%	8	89%
Bounced Waiting Line	17	5%	7	78%
On Time Schedule	16	5%	8	89%
Sudden Cancellation	14	5%	7	78%
Queuing Notification Availability	13	4%	7	78%
Actively Follow Up	12	4%	8	89%
Hospital Collaboration	11	4%	7	78%
Self Check In	10	3%	8	89%

Figure 1. Top 10 Interview Findings

The researcher interprets the statement into 3 main categories which are major challenge, key attraction, and solution recommendation. Major challenges to increase the customer satisfaction are waiting time and bounced waiting lines that were highlighted by more than 70% respondents. Key attractions that can contribute to the customer satisfaction are mobile application system, on time schedule, sudden cancellation, queuing notification availability, hospital staff collaboration, and self check in service. Solution recommendations that gathered from the top 10 findings table above is to provide clear information and to actively follow up outpatient.

The researcher also uses a fishbone diagram of Ishikawa (1968) to show the cause and effect relationship. The fishbone diagram is divided into two diagrams to answer each research questions as shown in the figure 2 fishbone diagram below:

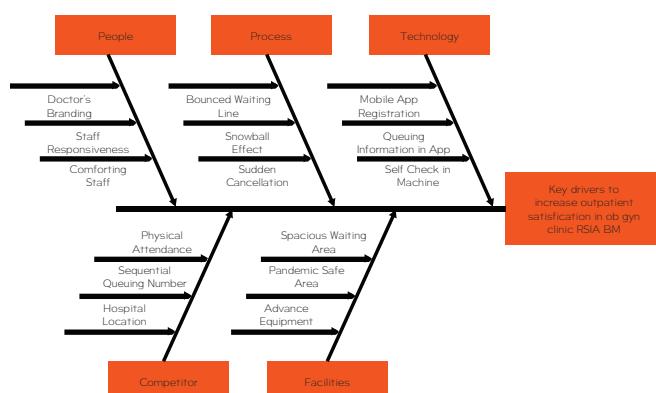


Figure 1. Top 10 Interview Findings

The fishbone diagram in figure 2 shows 5 main variables such as people, process, technology, competitor, and facilities that have cause and effect relationship to increase the outpatient satisfaction in RSIA BM.

People variables include doctor's branding, staff responsiveness, and comforting staff. The stronger these factors, the higher the outpatient satisfaction.

Process variables include a bounced waiting line, snowball effect, and sudden cancellation. Any issue related to the waiting line and snowball effect will create lower outpatient satisfaction, while the sudden cancellation of the other outpatient will help to shorten the queuing process and increase the satisfaction.

Technology variables include mobile application registration, queuing information in mobile application, and self check in machine. In RSIA BM, the technology for the queuing process is quite advanced because the patient can reserve consultation sessions through mobile application, check queuing waiting lines in the mobile application, and do self check in in a machine without queuing in the registration desk. Therefore the more technology variables available, the higher the customer satisfaction.

The competitor variables are also the key drivers of outpatient satisfaction because the better the competitor, the lower the satisfaction to hospital.

For facilities, as one of the key drivers to increase the outpatient of obstetric gynecology polyclinic RSIA BM satisfaction, the respondent highlighted the contribution of facilities to the patient satisfaction, especially the needs of Covid-19 friendly facilities such as spacious area that makes the patient feel safe and secured.

The researcher also uses the SWOT analysis framework to analyze the strengths, weaknesses, opportunities, and threats of the existing queuing process in RSIA BM compared to the other hospital. Therefore the hospital can be more focused not only in maintaining the strength and capturing the opportunity, but also improving the weaknesses and being aware of the threat from the other hospital. The SWOT analysis as below:

Strength: Compared to another hospital, RSIA BM implements advanced technology in the registration process. RSIA BM provides a mobile application that has a feature to check doctor's availability, make a booking, and to check queuing number live updates.

Weakness: The bounced waiting line has been mentioned by most of the respondents and counted as the top contributors to outpatient dissatisfaction and long

queuing waiting time. The other hospital did not experience a similar issue because the other hospital still relies on the physical attendance basis.

Opportunity: RSIA BM can still improve the existing process to gain the outpatient satisfaction and improve the overall queuing process, for example by providing clear information and actively following up the patient.

Threat: RSIA BM needs to keep improving the technology continuously because the technology keeps improving and the other hospitals can replicate the existing technology of RSIA BM.

IV. DISCUSSION

The researcher also gathered the outpatient satisfaction key drivers and queuing process contributor factors from the previous studies or literature review. Yiping Li, Weijuan Gong, Xiang Kong, Olaf Mueller, and Guangyu Lu (2020) mentioned 3 factors associated with outpatient satisfaction which are patient social-demographic factors, medical staff factors, and hospital indoor hygiene, facilities, and process management factors.

Communication is also related to customer satisfaction because in the healthcare industry, clear communication between doctor and patient, between the administration team and patient, or between the doctor and administration team is useful to ensure each party has the same understanding of the information given. This statement is aligned with Haran Ratna (2019) that stated healthcare literacy as one of the components of effective communication in the healthcare industry. Health literacy is the ability of the patient to obtain, to comprehend, to communicate and to understand the healthcare information and services, especially the basic ones.

Long queuing time also causes outpatient dissatisfaction. Hajar Ariff, M Ghazali Kamardan, Suliadi Sufahani, Maselan Ali (2018) mentioned that the queuing in many hospitals has been a big issue to the public. The queuing management is influenced by the registration and attendance management and the queuing supporting facilities. Dereje Mesfin and Tadiwos Gintamo (2019) also mentioned short waiting time is one of the significant variables of patient satisfaction.

According to Wenjun Cao, Yi Wan, Haibo Tu, Fujun Shang, Danhong Liu, Zhijun Tan, Caihong Sun, Qing Ye, and Yongyong Xu (2011), implementing a website-based registration system can effectively reduce patient waiting times and can significantly increase patient satisfaction with the registration process.

V. CONCLUSION

Based on the discussion of the findings in the interview, researcher's observation, root cause analysis, literature review, and benchmarking from the previous research, the researcher determined the root cause or significant challenges related to the outpatient satisfaction of the queuing process of obstetric gynecology polyclinic in RSIA BM. This conclusion relates to the initial research questions as follows:

1. What drives the customer's satisfaction?
2. How to improve the outpatient satisfaction related to the queuing process in the obstetric gynecology polyclinic at RSIA BM?

Based on the findings, the researcher interprets the research result into 2 highlights, which are key drivers of customer's satisfaction and the suggestions to improve the outpatient satisfaction related to the queuing process in the obstetric gynecology polyclinic at RSIA BM, that explained below:

a. The key driver of customer's satisfaction

The researcher defines the key driver of customer's satisfaction into 3 main parts, which are major challenges, key attractions, and other contributing factors to the outpatient customer satisfaction.

- o Major challenges to increase the customer satisfaction are waiting time and bounced waiting lines that were highlighted by more than 70% respondents. Besides those major challenges, the respondents also defined competitor advantages such as hospital strategic location, active follow up, and insurance coverage partners as a challenge to increase RSIA BM customer satisfaction.
- o The main key attractions that can contribute to the customer satisfaction are mobile application system, on time schedule, sudden cancellation, queuing notification availability, hospital staff collaboration, and self check in service. In addition to that, doctor's branding, staff responsiveness, spacious waiting area, pandemic safe area, and advanced equipment also contribute to the customer satisfaction.
- o The other contributing factors are Doctor's availability and snowball effect, because when the doctor is suddenly unavailable, the overall queuing process can be long or even canceled. Competitor uniqueness also contributes to the outpatient satisfaction in the queuing process, because the outpatient will naturally compare the better hospital service.

b. How to Improve the Outpatient Queuing Process

In order to improve the outpatient satisfaction related to the queuing process in obstetric gynecology polyclinic in RSIA BM, the respondents highlighted several improvement that can be implemented by RSIA BM, which are:

- o Active follow-up outpatient to remind patient's reservation, to ensure patient attendance, and to engage with the patient more by offering to reschedule the canceled appointment and by suggesting to book an appointment for the next check up session.
- o Providing clear information are needed to increase the outpatient satisfaction related to the queuing process
- o Ensure the snowball effect is prevented and the waiting time is maintained short, because these variables are significant and counted as the contributing factors of the outpatient dissatisfaction in the queuing process.
- o RSIA BM has to regularly assess the hospital's queuing process SWOT and compare the competitive advantage of RSIA BM queuing process to the other hospital, in order to sustain the business.

To conclude the research, The researcher highlighted several suggestions to improve the outpatient satisfaction within the queuing process as below:

a. Provides Clear Information

- o Clear information for the next step is needed after the patient finishes their online registration, especially for the new outpatient that has never been to RSIA BM, for example:
- o Your registration has finished, for the next step you must come to the hospital at least 30 minutes before your scheduled time, to prevent a bounced waiting line (late by 1 minute will be moved as the last queue). After you arrive at the hospital you may do self check-in through a machine that is located on the first floor near the registration desk.
- o After you arrive in the hospital you may check insurance validity in the registration desk that is located in the first floor
- o The queuing number can be monitored through the mobile application and will be updated by the polyclinic administrative team.

b. Actively Follow Up Stakeholder

Active follow up by administrative team is divided into several parts below:

- o To prevent sudden cancellation on the D-day and to prevent the snowball effect, the administration staff should actively follow up the outpatient to ensure their availability and attendance minimum in D-1 and actively follow up the doctor on D-day to ensure they can arrive on time. For any doctor's unavailability, the administrative team should also inform the outpatient actively and give new consultation estimation time to get outpatient understanding.
- o The administrative team should also offer to reschedule the appointment if the outpatient cancels their appointment due to personal reasons or disappointed due to doctor's unavailability.
- o After the consultation session finished, the administrative team may actively asking the outpatient to book the next appointment in polyclinics obstetric gynecology, especially if the patient needs regular control for their pregnancy

c. Waiting Time Monitoring

Since waiting time is the most mentioned keyword and the most major challenge to increase customer satisfaction, the researcher suggests the hospital should regularly monitor and improve the queuing waiting time SLA continuously as an improvement for the queuing process in the obstetric gynecology polyclinic at RSIA BM.

Based on the suggestions above, there are managerial implications that could be impacted. For example the management would need to add additional manpower to conduct active follow up to stakeholders and waiting time monitoring. The hospital would also need to create additional standard operational procedures or SOP to cover the new implemented process. The hospital would also need to invest in the system or technology development to be able to implement all of the suggestions given.

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Paper 56

Project management implementation and improvement
for complex project at PT. Minyak Emas Proses Company

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Abstract - Managing complex projects require professionalism. In the future PT. Minyak Emas Proses (MEP) as oil company will acquisition new block, invest in another energy company, even invest in the renewable sector, or transform into energy company that manage upstream to downstream, but in reality, MEP doesn't have project department, standard and procedures. The challenge is how to find suitable method for complex projects by starting from find factors that influence implementation of project management, then how to improve project management cycle and find solutions to the problems that occurs. This research is used qualitative and quantitative method to explore the gaps in internal, tracking unexpected events, compound interpretation. research involve nine respondents with the result is fifty-one findings, by using code interpretation then collecting ten findings with highest respondents' response as concern to be treated for solution. This research also proposed four recommendations as solutions to be implemented in the future, consist of implementation of five-dimensional project management, stakeholder integration and knowledge, engineering economics knowledge and project tools utilization.

Keywords - Project management, 5-Dimensional project management, complex projects, Qualitative research, Project tools.

I. INTRODUCTION

Many types of industries have been built in the world, they were built to support each country policies and develop economical aspects, one of the types of industry is energy sector that contribute to supply highly dependent and demand on fossil fuels and could be converted into power electricity, mechanical, and others. Particularly energy industries, involve: Traditional energy industries, fossil fuel industries, electrical power industries, renewable industries, nuclear power industries.

Continue with fossil fuel, focus in oil and gas, The oil and gas industry are broken down into three main segments: upstream, midstream, and downstream. Oil and gas development divided into three categories of development, first category is primary development, second is secondary development and third is tertiary development.

Darko, Emily, et.al (2014). There are five phases to the

life cycle of upstream oil and gas industry: Exploration, appraisal, development, produce and close.

Project in oil and gas industry basically as continuity of company portfolio goals, and commonly following with program and project goals, but for small company sometimes directly from portfolio to project target goals. typical of the projects that planned and will do by PT. MEP, consist of:

- o Drilling campaign, commonly this project is called or part of primary development.
- o Exploration area in Sumatra and east Indonesia, this becomes major concern to expand the production interest, and measure short-term and long-term development.
- o Preparing some improvements on facility production, according to emission reduction from boilers, engines that utilized for production process aiming to reduce carbon tax according to emission level from this equipment.
- o Early production facilities, these facilities must build after drilling already completed.
- o Production facility, at this point, company should consider build complex processing facility, the challenges are crude oil content has low API means contain wax or paraffin.
- o Acquisition another block also part of PT. MEP project target.
- o Invest in other companies, not just energy but open with other business sector, example biofuel development plant, biomass, bio-methane development.
- o Secondary development project.
- o Tertiary development project.

Refer to current condition, MEP has so many problems that can be used as lessons learn example many projects couldn't close out according to incomplete project deliverables, project delay, cost run over budget, inter department could not work properly to support the project orientation, Project team also confused about

project charter, how to design timeline planning, manpower loading, equipment loading, critical path, determine cost estimation, determine the risk, and lesson learned from previous experiences. Basically, MEP had never implemented project management, nor implemented project organization during executed all projects. MEP also doesn't have portfolio management, that's why all employees feel confused to plan development path properly example like measure priority which project is more priority than other projects and if connected with PT. MEP planning, the challenges are how PT. MEP find proper method to do these projects while at this moment PT. MEP don't have portfolio, program and project management team and procedure, standard. and the second is how to take decision which projects are suitable for PT. MEP condition. From PT. MEP point of view, mapping project complexity is important to do. the research focus with how PT. MEP could solve internal problem as stated above, research questions are limited just for two questions, involve:

1. What are the factors that influence the projects incomplete at PT. MEP?
2. What improvement should do to determine project priority at PT. MEP?

Commonly the objective of the research must be closely to the problem statement, so a study to find the answer why the project couldn't complete, find factors that influence complex projects and find some improvement to determine project priority. Specific objective of this research is:

- o To find why the project couldn't completed in MEP organization through qualitative, history or experiences how the organization should change its practices and adopted new solutions.
- o To assess and find kind of the factors that influence the projects at MEP.
- o To assess and find kind of improvement should do to determine project priority refer to the employee capability in analyze the problems and propose solutions based on their problems faced before.

The research is used qualitative and quantitative methods, primary data through interview as a source to analyze. Research through several department involve: subsurface, drilling, facility engineering, operation, operation engineering, finance, production engineering, they are involved in the projects in PT. MEP.

Limitation of research divided into:

- o Formulation of research objective: according to there is a necessary about project management

methodology, objective this research is to explore current condition about project process in PT. MEP.

- o Implementation of data collection method: Data collection is using interview by personally and consist of groups that did and will do some project
- o Sample size: this final project research is including small size only 9 respondents.

Hopefully output of this research is able to represent solution for the problems.

1.1 Literature review.

1.1.1 Project management and 5-DPM.

According to information above, PT. MEP will execute complex projects, knowing project lifecycle, the differences between portfolio, program and project must be understand well as explain on the table 1.1. Figure 1.1 describe project management process refer to PMI standard.

Table 1.1. Overview comparison project, program, and portfolio management.

(Source: PMI, 2017)

PROJECT	PROGRAMS	PORTFOLIOS
Projects have a narrow scope with specific deliverables.	Programs have a wide scope that may have to change to meet the benefit expectations of the organization.	Portfolios have a business scope that changes with the strategic goals of the organization.
The project manager tries to keep change to a minimum.	Program managers have to expect change and even embrace it.	Portfolio managers continually monitor changes in the broad environment.
Success is measured by budget, on time, and products delivered to specification.	Success is measured in terms of Return On Investment (ROI), new capabilities, and benefit delivery.	Success is measured in terms of aggregate performance of portfolio components.
Leadership style focuses on task delivery and directive in order to meet the success criteria.	Leadership style focuses on managing relationships, and conflict resolution. Program managers need to facilitate and manage the political aspects of the stakeholder management.	Leadership style focuses on adding value to portfolio decision-making.
Project managers manage technicians, specialists, etc.	Program managers manage project managers.	Portfolio managers may manage or coordinate portfolio management staff.
Project managers are team players who motivate using their knowledge and skills.	Program managers are leaders providing vision and leadership.	Portfolio managers are leaders providing insight and synthesis.
Project managers conduct detailed planning to manage the delivery of products of the project.	Program managers create high-level plans providing guidance to projects where detailed plans are created.	Portfolio managers create and maintain necessary process and communication relative to the aggregate portfolio.
Project managers monitor and controls tasks and the work of producing the projects products.	Program managers monitor projects and ongoing work through governance structures.	Portfolio managers monitor aggregate performance and value indicators.

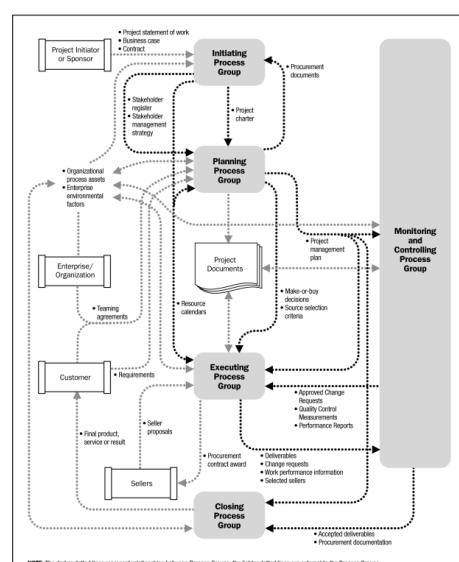


Fig 1.1. Project management process interaction.

(Source: PMI, 2017)

When conduct complex projects without proper way from portfolio, the projects will meet vary problems, portfolio management is needed as a way to bridge the gap between strategy and implementation, later on due to time limited and small organization condition, PT.MEP have to implement the project management, one thing as consideration is using five-dimensional project management, commonly used in mega projects highway road development.

The benefits of the 5DPM approach:

- o Implementable to all projects size and types of complex projects, don't necessary as large as mega project genre in application.
- o Linear to dynamic in project contextual, by improvement, innovation, and relational partnering, and emphasize critical success factors.
- o Could managing fully integrating teams across the whole complex-project life cycle.

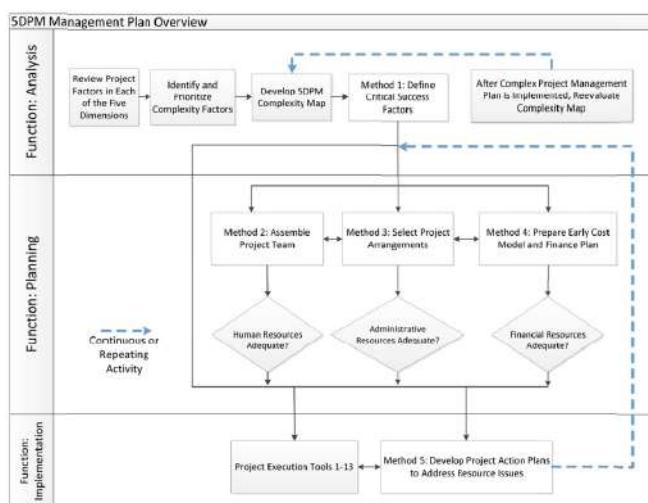


Fig 12. 5DPM process flow and overview of complex-project management.

(Source: David, J. 2013)

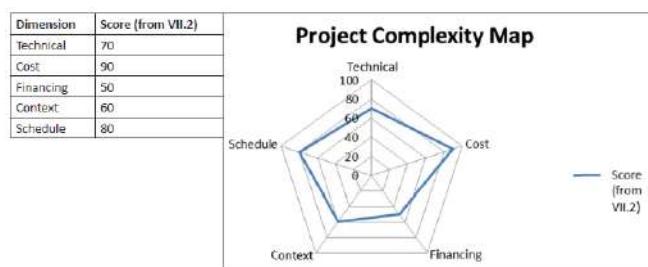


Fig 12. 5DPM process flow and overview of complex-project management.

(Source: David, J. 2013)

Figures 1.2 and 1.3 explain about how 5-DPM process and the output result of project complexity measurement.

1.1.2 Qualitative method.

There are six qualitative designs are described in this literature review, involve: ethnographic, phenomenological, grounded theory, historical, case study, and action research.

- o Begin with ethnographic. Ethnographic studies involve the collection and analysis of data about cultural groups, ethnography can be defined as the process that arranged systematically to observe, to detail, to describe, to document, and to analyze the lifeways or patterns of a culture particularly to grasp the lifeways or patterns of the people in environment.
- o Phenomenological studies basically examine human behavior and experience through the illustrations that provided by the people involved. The goal of phenomenological method is to define the meaning that behavior and experiences hold for each subject. This type of research is used to study areas in which there is little knowledge (Donalek, 2004).
- o Grounded theory. Grounded theory studies are learned about the data which collected and analyzed and then a theory is developed that is grounded in the data. Some of the terms used by Glaser and Strauss are really difficult for nurses to understand. Leininger (1985) wrote that in 1980 she began to translate their terms into what she called "standard English".
- o Historical studies, concern about how to identification, to locate, to evaluate, and to synthesis of data from the past. Historical research may be more difficult than others to conduct, the data for historical research are usually found in documents or in several relicts and several artifacts.
- o Case studies are further examinations of people, groups, or institutions.
- o Action research is a type of qualitative research that seeks action to improve practice and study the effects of the action that was taken (Streubert & Carpenter, 2002). There is no attention to goal of trying to generalize the findings of the study, as is the case in quantitative studies.

1.1.3 Root cause analysis

Root cause analysis (RCA) is the process of locating and excavating the root causes of problems to identify suitable solutions. Root cause analysis can be performed with an implementation of principles, techniques, and methodologies that can all be influenced to identify the root causes of an event or trend. The first goal of root

cause analysis is to evaluate and the root cause of a problem or event.

1.1.4 Analytical hierarchy process.

Choirat (2010) The analytic hierarchy process (AHP) is a decision-making procedure originally developed by Saaty (1977, 1980, 1986). The analytic hierarchy process (AHP) is a decision-making procedure originally developed by Saaty (1977, 1980, 1986). Centralize to the AHP is the measurement process, specific measurement on a ratio scale. Separable representations are important because they make it clear that individual ratio valuation could be subject to various cognitive interference.

II. METHODOLOGY

Based on information from point 1, this research is used qualitative and quantitative research, by in-person interviews conducted to know respondent comment or feedback regarding to oil company condition presently, it is conducted in various department involves drilling, operation, facility engineering, production engineering, sub surface and finance, with several position. Figure 2.1 explain step of research flow from problem discovery to conclusion and recommendation.

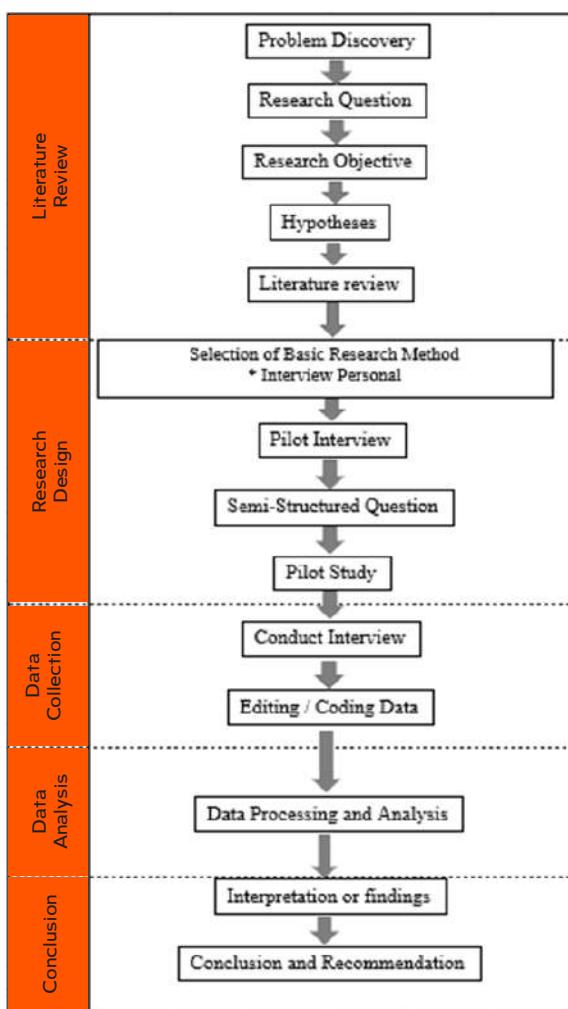


Fig 2.1 Research flow

2.1 Qualitative method

For someone who does more qualitative work, there can be another huge layer of work involved interviewing subjects will be a part of the study.

The difficulties during gathering data by conduct interviews are the respondents are don't understand or deep understanding about the management, in this case project, the more interesting things that may become boundaries are diplomatic aspect during answer the question, there is a lot of things must close, the respondents do not want to open their mistakes in the last time, need communication skill and art to know the respondents' character. Donalek (2004) wrote that conducting qualitative research is "a challenging, exciting, and at times, exhaustive process" (p. 517).

qualitative theory usually also considering several types of studies, involve:

- o phenomenological studies.
- o case studies.
- o Historical studies.
- o participatory action research.

This research is combining types as explain above, using case studies, historical and participatory action, but all comprehensive data related to quantitative is not insert and part of this method. After collecting interviews result, continue with data processing, determining words in interpretation data, respondent also asked to get fair meaning as mentioned as their thought not based on researcher conclusion or decision, so the result will giving accurate and precise "word" opinion, called coding interpretation, after determining and analyze interview result into six themes, twenty-three categories and fifty-one subcategories.

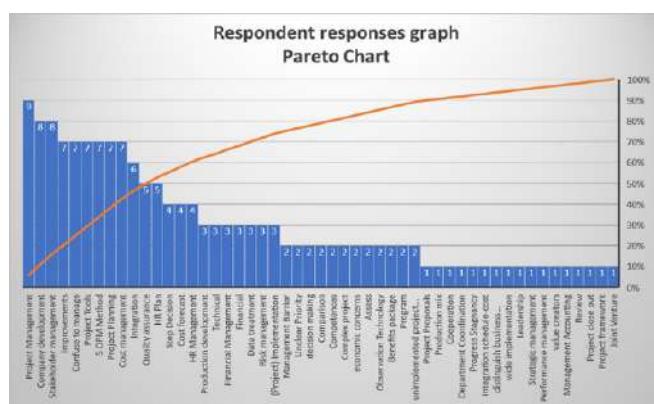


Fig 2.2 Respondent responses pareto

Figure 2.2 represent respondent responses from the highest to the lower quantities of response. Pareto chart is used to classified sub-category arrangement and able to analyze what factors are important from respondents' point of view. Figure 2.3 support the pareto chart result showing level interest from respondents.

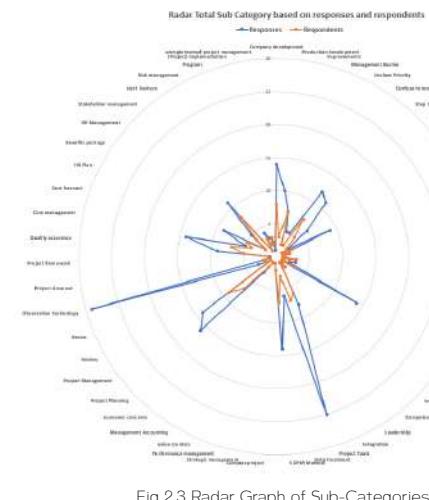


Fig 2.3 Radar Graph of Sub-Categories

Theme	Category	Sub Category	Qty	Rpd
5 DPM	Project Management	Lack of Project Management	14	9
		Lack of Stakeholder management	11	8
	5 DPM Method	Unclear Project Planning	16	7
		Unimplemented 5 DPM Method	14	7
	Project Management	Lack of Cost management	14	7

Theme	Category	Sub Category	Qty	Rpd
Development	Company development	Lack of Company development information	14	8
Theme	Category	Sub Category	Qty	Rpd
Integration Tools	Integration	Lack of Project Tools	25	7
		Lack of Integration	9	7
Theme	Category	Sub Category	Qty	Rpd
Management Responsibilities	Management Barrier	Confuse to manage	12	7
Theme	Category	Sub Category	Qty	Rpd
Improvements	Improvements	Unaware with Improvements	7	7

Table 2.1 Qualitative keywords grouping

Ten (10) higher factors from qualitative are grouped in table 2.1.

2.2 Root cause analysis.

the analysis is used Ishikawa diagram to represent problem and root cause that happen in MEP. Define the problem, data collection and identify possible causal factors also get from interviews and mind mapping then continue with identify the root cause. Seven (7) factors found in qualitative result are root caused in the problems that happen in MEP

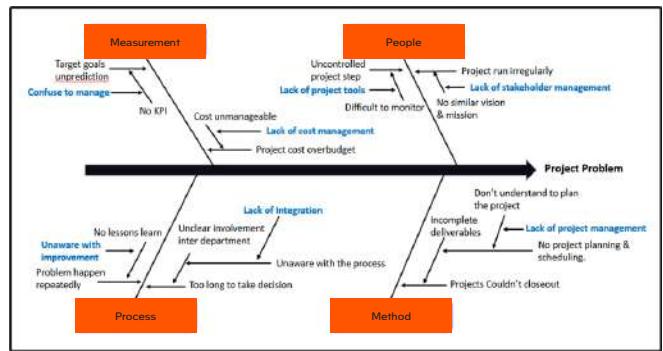


Fig 2.4 Root cause analysis

1.2 Analytical hierarchy process

Analytical hierarchy process is used during this research to ensure choose correct methodology that suitable for the organization and useful in the future without wasting time during align the adoption process and easily in line with company project target goals.

Principally to choose factors that suitable based on working environment by interviewing the respondents, to get data and factors that influence the project at MEP based on respondents' experiences. Refer to table 2.2, survey result from nine (9)respondents shown that project execution is poorly maintained at MEP and need further improvement, this condition also showing awareness from respondent related to unmanageable the project, basically respondents want to increase project performance.

Table 2.2 Respondent survey response quantities

No	Description	Answer	Respondent								Total
			DK	SI	AD	GD	SS	AP	SYT	AG	
1:	Project implementation quality		Excellent Good poor	1	1	1	1	1	1	1	9
2:	Project performance		No need Improvement Hired Improvement	1	1	1	1	1	1	1	9
3:	Three factors that influence project based on experience		Bureaucracy Complexity Process timing Cost attention Technical Report Attention to skills	1	1	1	1	1	1	1	8
											9
											5
											3
											2
											0
											0

there are three (3 factors) as major factors to determine what project methodologies are suitable from seven factors considered previously by respondent, seven factors involve: Bureaucracy, complexity, process timing, cost attention, technical, report and attention to skills while top three factors based on survey are bureaucracy, complexity and process timing, these factors decided to refer to number of respondents that given responses.

Then three factors become points foundation to measure the methodologies, survey conducted two times, the first survey has purpose to find factors and the second survey has purpose to measure correlation between factors and these methods. Nine respondents also involved in the second survey, principally respondents can ask or phone their friend that have expertise in project methodology or they can give their opinion. There are three methodologies

that proposed to execute the project, involve: conventional portfolio-program-project management, project portfolio management (PPfM) and five-dimensional project management (5-DPM). Table 2.3 below is shown about three methodologies compare with factors; blue highlight means number of responses from respondents.

Table 2.3 Respondent response according to project methodologies

No	Description	Answer	Respondent								Total
			DK	OK	AD	GD	SS	AP	SYT	AG	
	Bureaucracy										0
1	Conventional > 5-DPM	Faster than									0
		Slightly faster									0
		Slower than	1	1	1	1	1	1	1	1	9
2	Conventional > PPfM	Faster than									0
		Slightly faster									0
		Slower than	1	1	1	1	1	1	1	1	9
3	PPfM > 5-DPM	Faster than									0
		Slightly faster	1	1	1	1	1	1	1	1	2
		Slower than	1	1	1	1	1	1	1	1	6
	Complexity										0
1	Conventional > 5-DPM	More complex									0
		Slightly complex									0
		Less complex	1	1	1	1	1	1	1	1	9
2	Conventional > PPfM	More complex									0
		Slightly complex									0
		Less complex	1	1	1	1	1	1	1	1	9
3	PPfM > 5-DPM	More complex									0
		Slightly complex									0
		Less complex	1	1	1	1	1	1	1	1	9
	Process timing										0
1	Conventional > 5-DPM	Faster than									0
		Slightly faster									0
		Slower than	1	1	1	1	1	1	1	1	9
2	Conventional > PPfM	Faster than									0
		Slightly faster									0
		Slower than	1	1	1	1	1	1	1	1	9
3	PPfM > 5-DPM	Faster than									0
		Slightly faster	1	1	1	1	1	1	1	1	6
		Slower than	1	1	1	1	1	1	1	1	3

After carefully analyze the data, ranging of sub-category could utilized as the important point as solution fundamental to explore and find the solutions.

Refer to table 3.1 below, there are ten highest sub-categories from respondent responses.

Table 3.1 Ten highest Respondent responses.

Sub-Category	QTY	Respondents
Project Management	14	9
Stakeholder management	11	8
Company development	14	8
5 DPM Method	14	7
Project Planning	16	7
Cost management	14	7
Improvements	7	7
Confuse to manage	12	7
Project Tools	25	7
Integration	8	6

The respondents are aware that based on their experience, the projects were not run smoothly and were not well prepared not just technical but also financing and external policy, that's why project management is placed as the first rating. Commonly the project teams mostly focus on project phases along the project life cycle, they pay less attention from the beginning of pre-project phases and tend to ignore the post project phases. Unequal perception, knowledge also different way and time during distribute some information to the stakeholder will impact to the project these condition that felt by respondent. According to findings and solutions proposed as shown on table 3.2, no.1 and no.4 are related to project management and need further analysis, while project

management cannot represent portfolio, how to adjust project management refer to company organization size, shareholder characters and business orientation become homework. These things should consider various factors and will be explore on the next point using analytical hierarchy process.

Table 3.2 Solutions for qualitative analysis result

No	Sub-Category	Solution	Treatment
1	Lack of Project Management	Project management implementation is necessary	Many project methodology could applied, need more assessment to inline with company necessary and adjusted with company organization
2	Lack of Stakeholder management	Implementation of stakeholder management	Stakeholder management take a broader view of the role of the board (and management), consistent way of identifying, analyzing, and responding to these critical interdependences. It represents an active, integrated approach to achieving corporate purpose
3	Unclear Project Planning	Project management implementation is necessary	Shall Clearly defined project requirements, map out a chain of communication, establish clear deadlines and roles, taking time to establish project objectives, goals and team members' roles
4	Unimplemented 5 DPM Method	Project management introduction	In the early stage, project management introduction is mandatory, then step by step continue analyse the condition and the nature of working environment
5	Lack of Cost management	Cost management familiarization	Introduction and exercise to familiarize project team with cost management are important to build proper culture
6	Lack of Company development	Management awareness and proactive within working environment	Transparency and open mind from management are necessary then continue build leadership capability
7	Lack of Project Tools	Project tools introduction and familiarization	Need training to introduce the tools, exercise and routine workshop
8	Lack of Integration	Team work building and inter-department engagement are	Management shall build employee awareness related to integration
9	Confuse to manage	Improve personal management ability	Self awareness from management and build self leadership capability
10	Unaware with Improvements	Commitment and awareness from top management	this is foundation to rise activity performance, begin with awareness and start to documentation of lessons learn.

Table 3.3 Project problem, RCA, Risk and Solutions table

No.	Issue		Root Cause		Risk		Solutions	
	Description	Level criticality	Description	Level	Description	Likelihood	Description	Level/Type
1	Project couldn't close out	High	Lack of project management	High	Project couldn't done well be repeated again	High	Project management	Medium
2	Project run irregularly	High	Lack of stakeholder management	Medium	Business process will be disrupt / interference	Medium	Stakeholder analysis and treatment	Medium
3	Uncontrolled project step	High	Lack of project tools	High	Project still unmanageable	High	Project tools utilization	Medium
4	Project cost over budget	High	Lack of cost management	High	Project will be postponed	High	Cost management implementation and familiarization	Medium
5	Too long to take decision	High	Lack of Integration	High	Project still delay and cost run ineffective	High	Integration inter department	Medium
6	Target goal unprecision	Medium	Confuse to manage	Medium	Activity decided without assessment	Medium	Leadership skills and project knowledge visualize	Medium
7	Problems happened	High	Unaware with improvement	High	Cost, activity, timeline	High	Implement improvement checklist and continuous improvement	Medium

RCA can determine and describe the problems that happened at MEP during executed the projects. principally solutions proposed using RCA are typical with qualitative analysis, but there is a concern with project management, which there are many methodologies of project management, this method should analyze and perform to get proper result and suitable for MTPN organization as shown on table 3.3.

To support analysis using qualitative and RCA, below is analytical hierarchy process that state three factors have chosen by respondents, involve bureaucracy, complexity, and process time, as shown on table 3.4.

While considering complexity as the most important to choose the methodology, 5-Dimensional project management is suitable to implement with score 0,64, which is the highest score compared with others. Both 5-DPM and PPfM offered complex management, mean user can compile both portfolio and project together, analyze all component following process flow of each methodology as shown table 3.5.

While user considering process time to choose the methodology, 5-Dimensional project management is suitable to implement with score 0,67, in fact 5-DPM giving simple direction using five methods inside the framework with thirteen tools, and giving shorter time during implement each phase, but again those are dependent on the project team capability, unusual implementation still affects uncertainty workflow during execute as shown on table 3.6.

Then while user is considering bureaucracy as the most important factor, PPfM (Project portfolio Management) provide shorter bureaucracy with score 0,64, PPfM provide framework to make user easily choose the right project as shown on table 3.7.

Table 3.4 AHP calculation to compare three factors

Comparison of Complexity, Time and Bureaucracy						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	5	7			
C2	0,2	1	5			
C3	0,34	0,2	1			
	1,34	6,2	13			

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	1	1	3		
C1	5	5	1,4	11,4		
C1	7	25	7	39		
				53,4		
Line 1						

Consistency Ratio						
Criteria	C1	C2	C3	Total	EViD	CR
Emaks	CI	CR				
3,07572	0,03786	0,06527	CR<1			

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C2	0,2	0,7	0,1	1,0		
C2	1	1	1	3		
C2	1,4	5	5	11,4		
				15,51		
Line 2						

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C3	0,14	0,04	0,14	0,33		
C3	0,71	0,20	0,20	1,11		
C3	1	1	1	3		
				4,44		
Line 3						

Table 3.5 AHP calculation by comparing 5-DPM, PPfM,

Conventional with bureaucracy aspect

Comparison methods with Bureaucracy						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	3	5			
C2	0,33	1	3			
C3	0,10	0,33	1			
	1,53	4,33	9			

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	3	1	5		
C1	3	9	3,67	18,67		
C1	9	27	7	39		
				53,4		
Line 1						

Consistency Ratio						
Criteria	C1	C2	C3	Total	EViD	CR
Emaks	CI	CR				
3,023	0,0115	0,01903				

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C2	0,33	0,33	0,33	0,99		
C2	1	1	1	3		
C2	1,67	5	5	7,67		
				11,93		
Line 2						

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C3	0,20	0,13	0,20	0,53		
C3	0,60	0,33	0,33	1,27		
C3	1	1	1	3		
				4,78		
Line 3						

Table 3.6 AHP calculation by comparing 5-DPM, PPfM,

Conventional with complexity aspect

Comparison methods with complexity						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	1	7			
C2	0,33	1	3			
C3	0,14	0,33	1			
	1,48	4,33	11			

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	1	1	3		
C1	2	9	2,15	18,15		
C1	9	27	7	39		
				53,4		
Line 1						

Consistency Ratio						
Criteria	C1	C2	C3	Total	EViD	CR
Emaks	CI	CR				
3,03112	0,01160	0,01903				

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C2	0,54	0,31	0,54	1,39		
C2	0,63	0,33	0,33	1,30		
C2	1	1	1	3		
C2	2,15	6	6,15	14,40		
				44,99		
Line 2						

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C3	0,54	0,31	0,54	1,39		
C3	0,63	0,33	0,33	1,30		
C3	1	1	1	3		
				44,99		
Line 3						

Table 3.7 AHP calculation by comparing 5-DPM, PPfM,

Conventional with process time aspect

Comparison methods with process time						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	0,33	3			
C2	3	1	5			
C3	0,33	0,2	1			
	4,33	1,53	9			

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C1	1	1	1	3		
C1	3	1,09497	3	7,07		
C1	9	27	7	39		
				53,4		
Line 1						

Eigen vector normalization						
Criteria	C1	C2	C3	Total	EViD	CR
C2	3	1	5			
C2	1	1	1	3		
C2	9	27	7	39		
				53,4		

understanding the people who will be working with and throughout the project lifecycle, always conduct consultation in the early stages to get same purpose, scope, risks and approach, find delivery solution by negotiation.

- o In small oil company with small organization, proper tools are really necessary to maintain effective and efficient of project and meet optimum cost budget, when decided to plan several complex small projects, company could use cloud based for project software, database, and framework
- o Skills and experiences necessary in project planning, not all employees understanding how to better plan, begin from level 1 task continue to detail task (Level 5-7), and not all employees have capabilities to do good discussion. HR should give training related to project planning and task planning, managerial skills, and some trainings to support the projects, evaluate and mitigate the gaps, it can come from bottom to up.
- o 5-DPM proposed or spoke by respondents based on knowledge that they get during improvement meeting, and sharing knowledge, but respondents can analyze which one is suitable for small oil company, respondents also spoke about project management, basically 5-DPM is adopt all PMBOK knowledge but all component could improve based on company necessary and complexity of the project, so users can implement portfolio-program and project in direct way using 5-DPM.
- o Projects end with how much money spend for the deliverables and cost are important and always highlighted by management and BOD, before project begin, looking for financing is difficult and must convincing many shareholders and stakeholder, that's why project conventional has three dimensional, i.e.: Scope, Time, and budget.
- o Confusing to choose proper methods for doing projects usually happen in company, not just small but large company also and getting complex due to accumulation of the gap inter-department relations, it depends on many backgrounds, and almost coming from different education background, type of business, management style, communication style or coming from many aspects, example social condition, local culture, local government policy, that's why leadership and management capability needed during planning portfolio, program and project, according to the company condition that don't have much team to do specifically task involve portfolio and program, management and the team together evaluate and

analyze which methodologies, tools are proper to implement for small oil company.

- o In each company always appear problem, and people who work for the company should contributing to solve the problem, and parameter of management capability measure by how they can solve the problem. From several respondent said that improvements necessary, even though some of them are disappointed with so many reasons, one of them is declined their critical thinking, although sometimes information or ideas coming from low or mid-level couldn't be heard by the upper management, this is commonly happened in each company, it depends on the management characters, that's why improvements always have barriers. Improvements must do continuously, if could, it can conduct transparently.
- o For small organization easier to align day-to-day activities than large organization, bureaucracy also simpler, to integrate inter-department also easier. To integrate, management should have strategy to provides the business an option to have control over various processes.

V. CONCLUSION

Refer to the research using qualitative framework, and analysis of the respondents' responses using radar graph and pareto chart, there are ten subcategories that have highest respondent as the gaps that contributing to the project in MEP company and become the most important parts to solve the problem, also as "flexible way" to combine step for portfolio, program and project management, the responses answer the foundation question:

- o What are the factors that influence the projects incomplete at MEP?
- o What improvement should do to determine project priority at MEP?

By answer question no.1, there are ten factors that influence project failure, analyzed using qualitative research, involve:

- o Lack of project management
- o Lack of company development information
- o Lack of stakeholder management
- o Lack of project tools
- o Unclear project planning
- o Unimplemented 5-Dimensional project management

- o Lack of cost management
- o Lack of integration
- o Confuse to manage
- o Unaware with improvements.

Factors that become root cause from the problems that happened, involve:

- o Lack of project management
- o Lack of project tools.
- o Lack of stakeholder management
- o Lack of cost management
- o Lack of integration
- o Confuse to manage

- o Unaware with improvement.

Both qualitative and root cause state almost similar although qualitative more comprehensive define all factors, but both are able to answer the research questions comprehensively. Several factors are similar, example lack of project management, lack of project tools, lack of stakeholder management, cost management, integration, confuse to manage and unaware with improvement. Seven root causes are part of ten findings.

Based on project management framework that consist of:

- o Scope management
- o Time management
- o Cost management
- o Quality management
- o Human resources management
- o Communication management
- o Risk management
- o Procurement management
- o Stakeholder management
- o Project integration management.

Several findings could grouped become part of project

management, involve:

- o Lack of project management
- o Lack of stakeholder management
- o Lack of cost management
- o Lack of integration

Then to implement project management within the organization should consider carefully, adjustment and in line with the goals are mandatory, that's why further analysis using quantitative like analytical hierarchy process is important. Data source to analyze came from interview the respondents, mean still using qualitative method. There are three factors in considering three methodologies consist of bureaucracy, complexity, and process time. Refer to AHP analysis, complexity is the most important thing to consider what method is suitable for conduct the project.

Three methodologies had proposed to adopt in execution process, those were analyzed using AHP method, from AHP result, each criteria have different methodology, for criteria bureaucracy, 5-DPM is suitable than other methods, criteria complexity also shown that 5-DPM relevant and suitable than others, for criteria process time, project portfolio management more relevant and suitable than others.

There are four recommendations from analysis result and from respondents' advice. From the conclusion and the respondents' advice in chapter 3, the author collected and find four solutions as recommendation:

- o Implementation of five (5) dimensional project management.
- o Stakeholder integration and knowledge to create complex projects.
- o Engineering economics knowledge.
- o Project tools utilization.

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Paper 57

Proposed Materials Management Improvement for Newly Operated Oil and Gas Company (Case - Black Gold EP)

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ICMEM

The 7th International Conference on Management in Emerging Markets

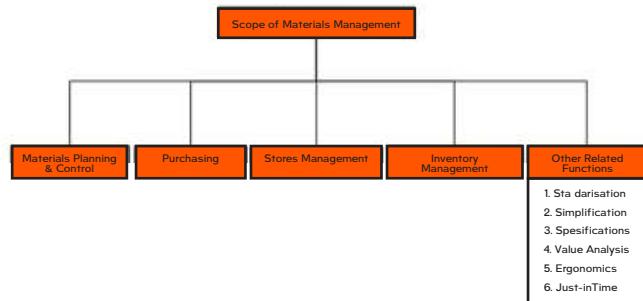
Abstract - In order to remain competitive, oil and gas companies differentiate themselves by being able to efficiently produce their product. Therefore, ability to manage supply chain becomes one of differentiation factors to gain competitive advantage in industry, including materials management. This research aimed to propose the improvement in Black Gold EP's materials management. The improvement process was done through qualitative approach of one-on-one interviews that compared the findings with the literature review. The results of the process found there were 6 (six) challenges that are considered as the root causes of materials management issue, they consisted of (i) lack of quantity control, (ii) no standard operating procedures, (iii) incompetent personnel, (iv) insufficient integration of information, (v) no materials preservation, and (vi) no quality inspection. Furthermore, there were 6 (six) proposed solutions that were built out of these root causes to answer the research question. Finally, to ensure the success of the implementation and enablement of continuous improvement, stakeholder engagement, early strategy development and deployment of principal of materials management were recommended.

Keywords – Materials management, oil and gas, supply chain management

I. INTRODUCTION

Materials management (MM) is one of main important aspects in company's supply chain management (SCM). According to Reference [1], materials management is an end-to-end process of flow of materials that includes planning the required materials, releasing purchase orders, providing transportation to the sites, storing materials and shipping them to operational sites when they are required, and, when necessary, disposing of unutilised or obsolete materials. Materials management in upstream oil and gas company covers finished goods used in both the day-to-day production facilities and construction of large capital projects [1]. Its functionality serves many purposes in facilitating the company's activities since it is able to communicate information regarding required material throughout the supply chain, whether it is to ensure material availability for execution and define the required materials in planning process, provide materials handling, conduct inventory control, and determine the procurement strategy and facilitate transportation [15].

Reference [11] identified the materials management the scope as depicted in Figure 1.



Black Gold EP is a newly established upstream oil and gas company that has been actively developing and exploring its working area. In the last couple of years, the production has been continuously growing. The company has established functional departments however each of them still doesn't have established management system including its disorganised materials management. As the consequences the company failed to establish the flow of materials to record and report the status and condition of materials then eventually led to the materials availability issue.

Materials availability is seen to have significant impacts in the operation because its critical presence for the operations to avoid costly down times/ interruptions in the operation. Therefore, to ensure the availability of materials it is important for the company to improve materials system that is able to provide accuracy in flow of information and manage physical flow of materials which allow uninterrupted activities.

This research aimed to design suitable improvements to establish materials management system that can address existing materials management practice in the company. The improvement in materials management system was conducted by initially identifying the issues contributing to the failure to perform materials management. These issues were then analysed and used to design appropriate improvement in existing practice. Through the establishment of organised materials management, it was expected that the activities carried out in the company can be well defined to perform materials management and issues associated with flow of materials/ materials management can be reduced or even further eliminated.

II. METHODOLOGY

The research deployed qualitative method approach which is seen to be more suitable to facilitate the data collection and obtain reliable information on individual meaning and complexity of the problem [5]. The one-on-one interviews were incorporated to gather information from people within the organisation (see TABLE I). The questions were manufactured to cover all aspect of materials management in the company that can lead to the solution of research question: *What are the necessary solutions to improve materials management in the company?*

Furthermore, the analysis of these interviews was carried out by essence-capturing the associated issues found in transcripts of interviews into keywords/ codes. To keep the analysis focused, the number of keywords/ codes were reduced by selecting some of the codes. Due to the establishment of principle of a "commonality", the keywords were selected based on the highest number of respondents that mentioned a particular keyword/ Code, where they share the similarity between them, rather than how frequent the keyword was mentioned [14]. Furthermore, analysis and discussion towards selected keywords were conducted before categorising them as the root causes of materials management issue. Finally, solutions that were built out of these root causes were proposed to provide the improvement in materials management for the company.

TABLE 1 - RESPONDENT PROFILING

Cluster	Department	Respondent	Role in MM
1	Engineering	R1	Planning and End User
		R2	Planning and End User
		R3	Planning and End User
2	SCM at Office	R4	Procurement
		R5	Procurement
		R6	Procurement
3	SCM at Site	R7	Inventory Handling
		R8	Inventory Handling
		R9	Inventory Handling

III. RESULTS

The findings found the following root causes of existing implementation of materials management that contribute to the materials availability issue in Black Gold EP.

A. Lack of Quantity Control

This issue captured issue in inventory control activities because of the lack of management in quantity of the inventory. This issue was conveyed by all 9 respondents

with total mention of 16 times.

"It doesn't help my work as user because no one manages the inventory and controls quantity of tubular materials, casing and everything at site" (R2)

Furthermore, the interview shows one of noticeable challenges where the situation led to extra work done by the user to re-calculate availability of materials prior the execution as per statement by R3.

"It is the same, there is no inventory control so every time we want to drill, we ask our company man to check, the drilling supervisor. So, every time we finish with 7 section, after the cementing since the tubular activity is the most important one, we always instruct to our drilling supervisor to do inventory on the number of casings left" (R3)

B. No Standard Operating Procedures

The keyword was mentioned 27 times among 8 respondents. The issue often was linked to non-optimal materials management and non-existence of standardised material management activities and appeared when the respondents were asked about their opinion regarding the standard operation of material management procedure in the company.

"Ok, if I see what is here it is not well structured, I mean there is no SOP so the process flows just based on the ability of each individual for example if it has the ability in SCM or in User." (R5)

"Nothing that I am aware of. In planning we don't have Standard Operating Procedure (No SOP), everything just flows according to our technical experience" (R2)

The statements of No SOPs occurred in every scope of materials management and it was recognised either by the designated practitioner such as R2, R4 and R8 or by personnel from other department or function such as R3.

C. Incompetent Personnel

The keyword came up 17 times from 8 respondents. This keyword often appeared when people were expressing the dissatisfaction of personnel performance due to ineffective execution and inability to perform the work that they were tasked to.

Following is the situation faced by the procurement person as R4 was asked for helping the user to determine the scope of work.

"All of them comes out of the sudden or sometimes unclear, for example they need items for certain activity but they don't know how much it is and instead they hand

"it over to procurement to look for, which is not supposed to work like that." (R4)

Another one was associated with behavioural that was referred by two statements from R7 below.

"But there are ones that are lazy (Incompetent personnel) and do irrelevant work and sometimes he is not there when we need him. I personally feel lack of support from the team." (R7)

"I think it is behaviour, I think he is not that capable, the work is not satisfying (Incompetent personnel) I am now working alone more." (R7)

D. Insufficient Integration of Information

This keyword was mentioned by 7 respondents with total mention of 13 times. The Insufficient Integration of Information can be interpreted as the absence of inclusive distribution of materials information throughout the chain causing incomplete or unavailable information to the people or functions that need such information in a timely manner related to the flow of materials.

"What I experienced, sometimes it is only based on the call informing that the material will come without giving exact time of arrival. The document available is only the delivery slip by the driver." (R9)

"Interestingly I am always be the last person who get information on materials coming to site (Insufficient integration of information). Supposedly I have to be the one to be noticed because we need to prepare the tools for materials mobilisation such as forklift. And I usually get the information by WhatsApp because the utilisation of email is not really intense here." (R7)

From R7 explanation, it is noticeable that the company was lacking in proper information distribution between departments which hindered the preparation for the handling of materials movement at the site.

E. No Materials Preservation

This was found to be mentioned 13 times among 7 respondents. This keyword was likely to be the root cause of defective and indecent materials found before performing the work due to the absence of materials preservation.

"Some materials are moving as the drilling activity moves but there are some of them that stay, the items that stay are just put like that, without one who preserves and looks after." (R2)

"There is no such a thing and no preservation of materials

because it is not our responsibility, this should be included in material management person's responsibility for the warehouse." (R9)

During the interview, this keyword was mainly mentioned by the users concerning the preservation and lack of dedicated person to perform the job.

F. No Materials Quality Inspection

The quality inspection during receiving materials was found to be unavailable. This was mentioned 11 times by 7 different respondents.

"We have receiving but we don't have quality inspection, so when personnel do the receiving, they never check what the materials are, whether it is correct or not, how the condition of the materials are" (R3)

"In here, it seems we don't have one for such process (materials quality inspection). Supposedly, if we want to conduct procurement, we have to include the inspection, especially goods, but here even massive goods we don't inspect because of time constraint requiring immediate use of materials" (R4)

Findings showed that this issue was consistently brought up by procurement team and field team were observed to be the clusters that they were asked about quality inspection in material receiving process.

IV. DISCUSSION

A. Lack of Quantity Control

In general, the lack inventory control represented the absence of inventory quantity monitoring has failed the company to achieve the objectives of inventory itself. The association made through the findings showed that lack of quantity control affects other chain of materials management including inaccurate materials data, materials planning, purchase, storing and even materials distribution.

Further implication of this leads to inaccurate inventory data that lead to the failure to keep the availability of inventory, monitor inventory levels and determine what levels the inventory should be maintained, when items should be replenished and how much the orders should be, as per objective of inventory system [10].

B. No Standard Operating Procedures

From the interviewees' responses it was indicated that No SOPs led to people working based on experiences they knew indicating different approaches done among the personnel. The missing of standards led to variations

in materials management execution. These absences were observable in inefficient practice done by personnel creating some wastes such as redundancy in execution, extra motion in process execution, waiting time by personnel.

On the other hand, standardisation enables process stability whose objective is to establish a basis for consistency to further create a fundamental of true improvement. Having stable process also allows higher flexibility and ability to meet customers' requests [2]. SOPs don't only serve as the basis of continuous improvement [13] in the company but also provide to reduce downtime and wastes, increase efficiency in operation as well as upgrade job satisfaction within personnel [8].

Therefore, it is important to have standard operation documents in the form of standard procedure, flow process and/or standard work etc. as guideline to execute materials management. The deployment of these standards is not only able to create standardised and efficient practices but also serve as benchmarking baseline for continuous improvement due to standardisation of the practice [13].

C. Incompetent Personnel

The statements from interviewees show that Incompetent Personnel are related to capability of personnel in terms of behaviour and their deliverables when performing their responsibilities. The impacts of this issue created disadvantage to the involved stakeholders in the chain of materials management process, because of ineffective execution, irrelevant work or out of scope work being performed and as well as lack of support.

Competency of personnel is one of important aspects in materials management in which the framework runs in sequence, therefore the failure to recognise this issue in one activity of materials management will affect other activities as it creates a burden to carry by people or team in subsequent process.

Reference [4] also defined the incompetency as an inability to complete the job according to satisfactory standard created by employer, based on company's standard. The signs of incompetency include late submission of work, over budget, error and help required from others to complete the work [4].

D. Insufficient Integration of Information

Looking back to the findings on Insufficient Integration of Information from some of interviews, it showed that the lack of integrated system hurt the company because the significant amount of information that needs to be exchanged in supply chain of materials. It also seemed a

challenge to get the information of materials distributed to the people in departments where the data was needed. The indication of the absence and incomplete information conveyed by the interviewees created gap for people to take appropriate actions towards materials handling and control.

The issue was triggered due to the utilisation of technology that only informed several people in organisation, such as the utilisation of WhatsApp or call, here information would only be distributed or informed to a person in subsequent department instead of all people in all functions involved in materials management chain of supply. In other words, it required another effort or "duplication effort" to distribute the information to other persons/ departments involved in supply chain of materials management which showed the non-ideal integration system [6].

In addition to that, the practice in the company in utilising EDI (Electronic Data Interchange) was similar to 'inefficient integration' [6]. They described the situation where the companies were equipped with the tools to automate the flow information but they were not able to maximise the utilisation of the tools because the unavailability of standards infrastructure leading to excessive capital investment, redundancy effort, high requirement of personnel and support and lack of organisational flexibility.

Ideally, the data coming from automated sources (software applications, control systems, bar code readers, sensors, analytical instruments) and manual interactions, will be entered once then be accessible to any platform where it needs to be [6]. With that it was suggested that having automatization for high frequency routine data input and information flow transmitted complemented with standard formats should be incorporated [6].

E. No Materials Preservation

Maintaining the quality of inventory materials from it is received until it is distributed should be part of materials management. The failure to keep the quality will hinder the objectives of warehousing in providing the materials to deliver the materials in timely manner, provide cost minimisation of moving goods and materials quantity accuracy for execution [3], which also align with materials management objectives in right quantities, right time, right price, right source [12].

The identification in findings showed that the absence of materials quality management failed to maintain the inventory in good condition and did not serve well the customers' interests. In this case, the objectives fell short because of the failure in delivering a timely customer service due to defective inventory resulting in additional work and time for the user, the failure in minimising cost of

moving goods due to reselection materials, and the failure in facilitating communication with customers because of inability to keep the quality of materials that created gap in between planning and execution.

F. No Materials Quality Inspection

In the interviews, despite of noticing the absence of materials quality inspection by some respondents, this keyword was also associated with things such as limited time between procurement and materials utilisation and lack of commitment by management.

In order to prevent undesirable quality of materials entering the inventory, quality inspection as part of materials handling that is conducted during receiving is needed.

The absence of materials quality inspection during receiving scope of storage and warehousing created ineffective and inefficient practices for warehousing activities. These activities were found to potentially be causes of user dissatisfaction about defective materials. Moreover, the absence of these activities results in unattainable objectives of warehousing, as the umbrella of materials handling, which includes the failure in delivering the materials in timely manner, providing cost minimisation of moving goods and materials quantity accuracy for execution [3].

Therefore, the absence of quality inspection during receiving also could indicate that defective materials might come from the absence of inspection instead of unimplemented materials quality management as a part of receiving process (as previously discussed), because both of process are laid out consecutively in the chain of materials management.

V. CONCLUSION

The implementation of materials management in Black Gold EP has been challenging. The issue on materials availability initiated this research to understand the contributing factors and come up with solutions of challenge. Therefore, to provide a clear guideline in achieving it, the research question was established: *What are the necessary solutions to improve materials management in the company?* Qualitative approach is incorporated throughout the process and found that there were 6 (six) materials management challenges in the company consisting of (i) lack of quantity control, (ii) no standard operating procedures, (iii) incompetent personnel, (iv) insufficient integration of information, (v) no materials preservation, and (vi) no quality inspection.

To build the solutions out of these root causes, 6 (six) were proposed solutions which included (i) deployment

inventory control system to support the function of inventory management that is defined as policies and control that monitor inventory levels and determine what levels the inventory should be maintained, when items should be replenished and how much the orders should be [10]; (ii) establishment of standards such as operating procedure, standard work, standard flow process, policy and standard measure (KPI) to achieve stability and consistency in activity thus further create the fundamental of true improvement for the company [13]. In addition to that, standards become part of quality systems which are important to organisation competitive benefit to achieve organisation objectives [2]; (iii) management of competency focused on the personnel to enhance individual's competences. This includes selecting, classifying, and assessing individuals, managing their careers, developing them, and appraising their performance [9]; (iv) implementation of proper tracking and visibility of information about the materials that are consistent, up-to-date, and accessible throughout the cycle of materials management to achieve a comprehensive value chain approach to materials management [1]; (v) determination of suitable preservation method and protection technology to enable the function of storage and warehouse management [11]; (vi) establishment of quality inspection process that records quality damage or discrepancy during materials receiving as part of storage and warehouse management where the received goods are verified against bill of landing and quantities, quality inspection and damage reporting [3].

Furthermore, to implement the proposed solutions, it is recommended to (i) prioritise standardisation/simplification in varieties of purchased materials/goods for the operation to create commonality in asset management that reduces the variety of materials and complexity of materials control/inventory model; (ii) create contractual strategies for critical materials to adopt comprehensive value chain of company and suppliers and to maximise the value of the inventory materials; (iii) develop supply chain strategy involving the whole activities of materials management (planning, procurement, materials receiving, inventory management and storage/warehousing) at early stage of project that involves all associated stakeholders to determine actions/approach required for the foreseen and unforeseen events; (iv) apply continuous improvement by identifying the inefficiency and ineffectiveness in materials management practices to address root causes in materials management and achieve stability of company's operation based on pre-determined standard measurement (KPI); (v) engage stakeholders involved on the chain of materials management to gain their expertise and expectation as well as to educate them regarding materials management; and (vi) deploy technological software application to support the proper tracking

system which enables integrated information throughout the chain of materials.

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Paper 58

Improving The Employees Work Performance Using Push and Pull Theory to Develop Company's Supply Chain in Indonesia

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Abstract - The objective of the research is to determine the implementation of "Push and Pull Theory" for assisting the employees that contribute their work in the supply chain division in the company located in Indonesia. Identifying the employee responses through a semi-structured interview for more deep interpretation from their experiences, the questions interview is using the COM-B Model to support the open-ended questions for 3 categories consisting of Capability, Opportunity, and Motivation. Then analyzing the employee's answer with the help of NVivo to find the word pattern that would be the important indicator to know the possibilities of "Push and Pull Theory" implementation of each component. The result of the interview showed that the interviewee agreed the use of the theory could help boost the work process especially in the supply chain division. Examining the answer from each category's questions will help to conclude suggestions for increasing the potential of the theory implementation. This search also suggests supervisors from the upper division of the company could contribute to raising the motivation inside the employee for creating a positive environment for work.

Keywords - push and pull theory, supply chain, employees

I. INTRODUCTION

Background

Business in a company will always have their standard to fulfill their requirements. Every role will have their own setting key to success and using communication as the main key (Neilson, Martin and Powers, 2015) In terms of lower boundaries and increased global openness, the essential process of globalization and business actions reflect projects with both success and risk and failure potentials, from the industrial revolution to the present day, irreversible global economic integration has caused business to develop (Katerina, 2014) This shows that any business could jump into a serious environment, competing in another level will require the employee to be more agile and ready. According to Ramanathan and Ramanathan (2021), globalization has brought business to so many countries and opened so many opportunities. Having the ability to be different is one of the keys that make companies have their own specialties, especially in the supply chain components. Understanding employees' values, motives, and sources of satisfaction is an essential

part of human resource management in a company (Sainju, Hartwell and Edwards, 2021).

Indonesia is the world's biggest archipelago and the world's fourth most populous country, representing a large domestic market for investment. Six official religions are officially recognized. The Indonesian labor force is estimated to be over 113 million people. The Indonesian labor market is being strained by the country's fast-growing population, with an estimated 2 million newcomers looking for work each year. Agriculture and services are the two largest industries, employing 43% and 44% of the workforce, between (PwC and HSBC Commercial Banking, 2012) Living in a large population scale of people, determines that the job market is very competitive and high. It is commonly known that enterprises that understand how to use and develop in their resources can grow more quickly, and that this could be used as a business strategy in international markets. High-performing workers who are motivated to stay with the company could be the key to a company's image (Vosloban, 2012)

The outbreak of COVID-19 has resulted in major changes in the way enterprises operate, altering employees' daily routines and activities. At the same time, the introduction of Industry 4.0 (I4.0) offered new technologies that may make such actions easier, reducing the impact of COVID-19 (Narayananurthy and Tortorella, 2021). This current situation has forced employees to adapt in a very uncertain condition, especially in the business environment. Helping employees to increase their performance while also adapting to the latest situation. Introducing "Push and Pull Theory" encourages the employee rather than 'pushing' the individual into professional dedication, it is the 'pulling' into an occupational professionalization commitment (McAulay, Zeitz and Blau, 2006). The structure flow of implementing the theory is similar to the concept of 'Do and Don'ts'. The individual will create a list of things that push them towards goals and create another list containing the things that pull them away from avoided disaster. These memos could be a guideline for the employee for working and even improving their work performance for the company supply chain process.

A. The Importance of Employee in Business Located in Indonesia

The sources of the company that could not be imitated

also as a competitive advantage are human knowledge and innovation. Employees hold the resilience key that drives the business, it is essentials to be able to understand the internal indicator (Saad and Elshaer, 2020) According to Schweitzer and Lyons (2008) as per the 3-stage framework that has been assessed the final components that could hold in the struggle for high-value talent are in the stage of the employment relationship, where thoughts from the employee job involvement doing the job are placed. Employees contribute a big part to every business; their performance determines the face of the company.

Theory behavior findings from (Satterlee, 2009, p.170) demonstrated that positive reinforcement, negative reinforcement, punishment, or extinction are the behavioral-based strategies of motivation that require responding to subservient behavior with positive reinforcement, negative reinforcement, punishment, or extinction. Supported by Shanks (2007) that finds that the workers' performance is affected by their skills, motivation or desires and environment conditions. The perspective of the workers could be determined through their characteristics (Sonnetag and Frese, 2001) and in the industry system having an open system could be identified from the broadening factors to the external and internal indicators (Borman, Ilgen and Klimoski, 2003).

Indonesia's economy is dynamic and growing at a rapid pace. Through their expanding skills and geographical reach, both locally and globally, PT Bank HSBC Indonesia has been able to actively contribute to the expansion of the Indonesian economy (HSBC, 2021). An example of an established banking industry in the country is the proof that business in Indonesia has been one of the great choices for a future investment. Opportunities of excellence performance could be found from the classified human resource. According to (HSBC, 2021), the labor of individuals in Indonesia are very productive and extremely open for improving their skills in competing in a competitive market based on their performance for the bank. Indonesia's middle-class population is rising, giving the country a remarkable area to do business in consumer goods. Within the ten-member ASEAN, it is also one of the fastest-growing economies. Indonesia has continued to sustain and improve its position rank throughout the last five years (IMD World Competitiveness Center, 2021). The outcome of job performance will be determined by the correlation between productivity and individuals, everyone will have their own expertise to contribute to their work division. This clearly demonstrated that Indonesian businesses place a high value on their employees' ability to perform effectively.

As globalization has opened new opportunities in a wider network, more challenges will be faced by companies. The

core and image of a company lies in the performance of the employees. The urgency purpose is to obtain the possibilities of the theory concept implementation that could improve the employee's performance. Hence, becoming the purpose for finishing the research for identifying, analyzing, and recommending the theory for employees' performance increasement. As a result, the goal of completing the research is to identify, analyze, and recommend the theory for improving employee performance.

B. Employee's Performance in Company Located in Indonesia

Whenever examining a company's internal operations, one of the most critical factors to consider is performance. This entails not just offering high-quality service and products, but also having a high-performing workforce, with employees exceeding expectations to a higher level, talent will always be pulled to and secured by a strong company (Vosloban, 2012). The foundation of a company could be rated from the company employee's performance. Employee engagement is a critical corporate goal now more than ever since engaged employees result in longer employee retention, increased productivity, and enhanced work quality (firstup, 2021). Schraeder and Jordan (2011) said that overall effectiveness of the worker performance may possibly determine an organization's long-term competitiveness. It should be noted that workers should be recognized as an investment. Companies in Indonesia will have the same opportunity to examine their company performance, although each individual employee has different key component improvement but there will always be ways to improve their performance and Carpi, Douglas and Gascon (2017) also agreed that effective performance management is critical for business, and it could be obtained through internal factor of employees. Work discipline refers to a person's willingness to follow all organizational regulations while performing tasks to meet intended goals (Ahiri et al., 2019).

One of the components that has been discussed is discipline effectiveness in the teacher's performance. This shows that an internal push inside every individual is very affecting their performance. Aji Irawan, Marsherina and Evasari (2020) also agreed that from 3 components of work motivation, job satisfaction, and discipline they observe that work discipline has a higher significance effect towards employee performance. Improvement towards employees' internal core will help their work performance, giving them training could deliver what kind of method that could implement towards their working performance.

C. Push and Pull Theory Concept

Motivation is the urge to behave in certain ways or the motive individuals do certain things. What's fascinating here is that sometimes the motive for action is positive, in the sense that we desire the result, and sometimes it's negative, in the sense that we're trying to avoid a consequence. All motivation humans have, every action we take, is driven by either a desire to achieve a certain result (push) or a desire to avoid an undesirable result (pull), visibility as a coin side where the result could show a different result but placed in a one concept (Maria, 2022) Spavey (2016) also agreed that the "Push Motivation" concept is a power that supports fulfilling and reaching the objective and the "Pull Motivation" concept is the sense of actions that they need to avoid. The concept of the theory helps the individual to form which action or activities that helps them towards achieving the goals and actions or activities that should be avoided to hinder any progress. Chowdhury (2016) examined the internal influence in employees' motives to move away from the work responsibilities, using the "Push and Pull" concept to generate 30.1% from the samples that the "Push" factors coming from the internal of the employees that have the motive to move away from the company contribution.

D. Implementation of Push and Pull Theory for Work Performance and Managerial Function

McAulay, Zeitz and Blau (2006) analyzed the correlation between "Push and Pull Theory" inside work commitment between employees in companies. The theory helps to emphasize that professionalism not being obtained from a 'force' towards the goal to be a professional employee rather it is something that 'luring' the employee to seek to become professional with willingness. The level at which your employees generate things or accomplish given duties is referred to as productivity, the perspectives of pull and push are at the opposite extremities of the production continuum. Boosting productivity by increasing customer demand is the aim of a pull perspective. A push approach, on the other hand, concentrates on producing as much output as possible without regard for demand (Lohrey, n.d.) The 'Push Theory' could help to detect those excessive activities do not lead to a productive result, meanwhile 'Pull Theory' could assist in balancing the work productivity. The 'Pull Theory' supports finding the opportunity in which part should be lessened. According to Denning (2010) in this current situation in the international market companies have jumped into more 'pulling' models in business. The demand will be pulling the employees towards the outcome of the product or service. Employees that are aware of customer requirements, capable of determining what customers seek, engaging customers with valuable offerings, and being reliable and responsible are all key success factors. Supervising the employees'

Abilities, Motivation, and Opportunities (AMO) could be used to determine job performance. These factors will have an influence on work since they demonstrate their capability, willingness, and possibility to contribute to it. Increasing their AMO will allow them to assess themselves and develop without feeling obligated (Finch, n.d.) The goal is to improve the employee's work performance, with guiding them to attempt in implementing the "Push and Pull Theory" concept by creating a certain list consisting of "Do Things" that will be the 'push' component internally towards excellence work performance and "Don't Things" that will show the 'pull' component to avoid any flaw.

II. METHODOLOGY

A. Philosophical Methodology

The selection for philosophical methodology to add for the research is using interpretivism. Interpretivism describes an approach that highlights the influence of people's personalities and role in social and economic life also supported with the interpretivism approach of adapting understanding in real life relies on individual participants' society (Elster, 2007) The approach is suitable for having more flexibility and broad understanding towards the objectives and Chowdhury (2014) conclude that interpretivism is a domineering in philosophical approach to assist on understanding of the society through the perspective of people behavior that is being explain and deliver from experience and words for a significant understanding.

B. Theory Development

Performing an inductive research approach will need an observation to see the pattern and seek conclusion (Streefkerk, 2022) therefore researcher will use the Inductive approach as the development theory of the study. The method is a simple, clear method for getting at conclusions in the subject of targeted qualitative approach (Thomas, 2006) with the efficient action and clear result give the ideal choice to continue the study and supported from (Thomas, 2003) that general inductive method is a practical and efficient method to analyze qualitative data from a range of research purposes. The theory won't be effective without the help of surrounding, (Marquis, 2009) also implied that one of the managerial functions is to address problems using a methodical way and to decide. The leader will be in responsible of practicing ethical behavior at work and distinguishing between positive and negative behaviors. When combining the value of practical activities could help to boost strategic thinking and the managerial competency (Goldman, Schlumpf and Scott, 2017) "Push and Pull Theory" has the purpose to assist the employee's competency and by the help of leader in the upper tier of managerial, the theory could be distributed

more efficient.

C. Qualitative Research

Layder (2006) explains that the goal of qualitative research is to investigate the entire situation in a natural environment in order to obtain the ideas and feelings of individuals being questioned or observed. Also, Palmer and Bolderston (2006) finds that qualitative research reports are typically rich in descriptive and could be a better option for specific topics in terms of discovery and depth comprehension. By selecting qualitative research will help the researcher to examine through the descriptive conversation and the value of qualitative research lies in its ability to identify complicated circumstances and the interpretation of actions in a particular environment, another bonus is to be more designed to obtain extensive and insightful information on a specific domain, fewer participants are required to deliver useful and relevant ideas although there are some challenges to get a valid result, the qualitative research is very time consuming, also need longer time verification to examine and extract, and carefully chosen the participants that is suitable with the objectives (Almeida, 2017). The researcher will carefully choose the resource by setting the criteria that will help with the study.

D. Study and Design

Research

The methodology for the research will be using interviews. In obtaining in-depth information on people's opinions, beliefs, experiences, and feelings, interviews are an effective strategy (Cardiff, 2006). The interview will also be conducted in a form of semi-structured, the interviewee will have space of freedom to answer and state with their own perspective, their answer will be the data that contain clarification and in-depth information.

According to Hughes, Williamson and Young (2022) the samples will be from any employees that have correlation job work in the supply chain of the company. They will answer the questions based on their thoughts referring to the implementation of the concept theory. The questions will be formulated from 3 behavior components. Timlin, McCormack and Simpson, 2020, determines the factors that influence the barriers and facilitators change. The COM-B helps to categorize simpler understanding of the responses and to conclude. A key benefit of the interview is its versatility (Bell and Waters, 2014, pp.177-194)

The COM-B consist of Capability (C) as an individual internal physical and psychological propositions, Opportunity (O) as the social and psychological that elevate an individual behavior chance, and Motivation

(M) as the brain procedures that underlie in movements of an individual (MacDonald, Fitzsimons and Niven, 2018). According to Timlin, McCormack and Simpson, (2020) the questions for the COM-B will still divided using Theoretical Domain Framework (TDF); Capability (C) will be divided into physical and psychological components, meanwhile the questions for Opportunity (O) will be divided into physical and social influence, and Motivation (M) questions will be divided into reflective and automatic responses.

Interview

The questions will be based on Hughes, Williamson and Young (2022) of COM-Behavior indicators, the questions will be divided into 3 categories of Capability (C), Opportunity (O) and Motivation (M). The questions could be seen in the table below. The flow of the interviews will be semi-structured, topic-guided, conversational, while also open-ended questions that are designed to allow participants to openly discuss their experiences (Britten, 1995). The questions will be correlated with their daily work task, this will engage them to dig deeper on their behavior towards the work goals. The interviews will be conducted using Microsoft Team Meeting (MS Teams) by arranging the time agreement via telephone or zoom video meeting depending on the interviewee comfortability. Preventing any kind of miscommunication and misunderstanding by giving a brief explanation sent before the meeting schedule.

Sampling

Participant	Gender	Work Position
Person A	Male	Sales and Marketing Division
Person B	Female	Production Senior Manager
Person C	Female	Supply Chain Management Manager
Person D	Male	Solution Section Manager (SCM)
Person E	Female	Marketing in Social Media Division
Person F	Male	Supply Chain Management Division
Person G	Male	Supply Chain Division
Person H	Female	Marketing Division
Person I	Female	Marketing Division

Figure 1: Sampling Table

The interview will be conducted by taking the sources from employees that worked in Indonesia, that will provide their answers from their expertise of field of work in supply chain division and experience. This will be relevant with the interview questions in asking their opinion. The individuals will preferably have a long-time work period but alternatively if could give the answer needed. Choosing

the Indonesia based work by asking their approval to conduct the interview will give more related information regarding the work performance and chances of the Push and Pull Theory implementation.

Source of behavior and definition	Components	Examples
Capability: being capable of performing the behavior	Physical Psychological	Physical strength, stamina Knowledge, skills
Opportunity: factors outside of the individual that make the behavior possible	Physical Social	Time, location Cultural norms, social cues
Motivation: the drive to want to perform the behavior	Reflective Automatic	Planning, evaluating Desires, impulses

Figure 2: COMB-Category Questions

(Hughes, Williamson and Young, 2022)

Analysis

The approach was interpretive and treated the answers of the interviewee as the perspective that could deliver their insights correlated with the COM-B model to identify the possibility of the theory implementation. Putting the strategic inter-facts and implications among the response together would help to understand the identification representations and the story behind them. The point of view will come from the human individual itself, through the role of "translator" of the interpretative analysis alone, and there will always be one connection of primary point among the range of replies (Autor: Dvora Yanow, 2000). A semi-structured interview was conducted and gave a brief explanation along with other explanations if the interviewee could not understand the questions interpretation. First, the data was collected by transcribing the answer from the recorded interview and taking the field notes on what the answer was about. Analyzing the transcript using NVivo software as the data management tool to categorize each of the lines by codes. From (Bazeley and Jackson, 2013) explained Nvivo could assist qualitative analysis by storing data to keep record of answers and topics. Allowing access to generate data and visualize any viewpoints, concepts, or categories found in the responses. Using the Nvivo will help to generate more effective analysis and finding relevant answers for the next step.

III. RESULTS

After inviting 9 of the interviewees, 2 of the interviews was conducted face-to-face, recorded using voice memos and 7 others were conducted using Microsoft Office Teams and recorded through the app directly, the range of the interview is from April 2022 and May 2022. The interviewee came from a different division but still within the range of supply chain process. Identifying the possibility of the theory implementation was given by example of the theory itself, explaining a simple activity such as creating a reminder or using post it will help to classify easier. The COM-B components coils help the

barriers or facilitators components for analyzing the semi-structured questions through the interviewee answers and categories the questions to several components to help identify the main point easier.

A. Capability

Knowledge

The interviewee raised their awareness about the theory, at the first glance from hearing the name of theory, some of giving their perspective based on the name of the theory or knowledge and some just say they did not know any of the theory:

"I don't quite understand the concept or the theory"
(Person E)

"Seeing from the words it shows a certain condition when it pushing and pulling something"

(Person B)

While some of the answer try to define the theory, there are also answer that related the meaning of the theory with work process:

"I think push and pull theory has the related with the production process where a push is factors that boosting the production and the pull is something is factors that pulling the production with factors

that are being considered for manufacturing" (Person C)

"I think it has the connection with a benchmark that used in a the industry work, because before I studied in industry major I think this there was a connection in a force of a direction and same thing with the pull factor" (Person D)

For guiding to the right information, giving explanation of the theory with simple definitions and examples has taken the place in the interviewee's understanding. There all so understanding with the new digitalization implementation, where the theory has similarities with reminding, to-do-list, and do-and don'ts:

"Yes, I think I used in form of application to track with my work partners and the application is called Trello"
(Person D)

"After hearing the brief explanation about the theory it seem that's the theory has the correlation with a to-do-list concept in daily activities" (Person A)

Although hearing the explanation with examples in Do-and-Don'ts theory Person C and Person A define that the theory did not have the similarities:

"In my perspective I think it is not the same because it's more to have correlation between one another, the two things has like a tugging activity" (Person C)

"I still could not assumed if its have the similar concept or not" (Person A)

Person C explained from her thought by the experience of working in the supply chain process division.

Memory, Attention, and Decisions

Not only Person A said that it did not have the similar concept but also not having quite the attractiveness:

"Not Quite, I say it's not very attractive...."(Person A).

Although it seems that is not quite attractive for someone to use in job, but the possibility of the implementation in daily work is easy, simple, and applicable:

"Yes it is very easy and it could really affecting the work performance" (Person H)

"Yes, It's quite easy to create a to-do-list based on the example of the theory itself" (Person A)

Person I also agreed and implicitly said that anyone could use it "Yes, I could say it is very easy because I think everyone knows how to use as simple as reminder"

Different perspectives are also coming from different people. Participant H and I have mentioned that the concept theory could attract others to use it in work although Person A mentioned that the theory is not quite attractive, showing a possibility for anyone trying to use the example of the theory

Skills

Having an easy and supportive will help a lot in doing work, the participants shared their thought about the ability when using the example of concept theory in daily work:

"Yes I do, and I think everyone also could capable on using this theory to support their work activities" (Person H)

"Yes, because it is very simple and doesn't require much energy" (Person I)

Person H also mentioned that anyone could use it while Person C mentioned that it is becoming her habit to use google calendar as an example of the concept theory:

"I do believe I'm capable, because before knowing the detail of the theory I already have a habit to put reminder by using google calendar so there are no crashing schedule" (Person C)

Behavior Regulation

At the start of the interview, most of the interviewees did not have much knowledge of the theory and after being explained the participants shared their thoughts from their experience using example of the theory like using Post It as reminder, google calendar, or others:

"Yes, as I mentioned before using a reminder is the most frequent concept I use" (Person G)

"Yes, at my work division we used to sorted and create prioritize by using calender" (Person F)

From the capability category of the questions, it shows that the push and pull theory could be implemented with easy action and there are adaptations and right now a more modern usage for delivering the concept by using application for reminders, to do list, and calendar but only lacking the awareness of the concept label.

B. Opportunity

Social Influence

In the range of external components in the work environment came from friends and work partners. There are parts of other that could influence but the biggest effect came from inside personal motivation, finding the right support and creating a comfortable environment will help to increase work performance

"My environment most of the time is very supporting towards my work load" (Person I)

"For me, it is very supporting because there are my partners that becoming another reminder for different task" (Person I)

"More to becoming a helper and supporter, always catching anyone back for giving helps everyone need" (Person I)

Person I explained from different questions of the category but lead to the same answer about 'work partners as support' and other participants answer also agreed from her experience:

"Gratefully, my environment is very supportive to help me in work and always being my second reminder" (Person H)

"Having a big support came from around could give me motivation and adding from my personal list to do, it helps me to not forget my job task" (Person A)

"Partners is like the other part that could give big help to make work to be less, hehe and because I like to command someone then only need to recheck" (Person D)

Environment Context and Resources

The role of work partners could be important, but Person F mentioned that it will depends from how people interact it also:

"It will depend on the people and what are the objectives they want to achieve. Because I'm the kind of person that like to work with others, having the surroundings that keeping me updated so that I won't forget plus having a reminder on phone by calendar will be helpful" (Person F)

While Person G and said it has the equal chances of work partners to be a positive or negative impact: "For me, my partners has the a 50-50 on giving positive support and sometimes negative impact for me to work"

The opportunity that could affect someone's performance not only comes from internally, but the interview participants also believe that work partners could be a support or negative influence. The environment could affect a lot especially for someone doing their work.

C. Motivation

Emotion

The participants shared their thoughts after using the example of concept theory in doing work activities, there are participations that feel happy:

"I feel it's my professional side will feel very happy when work are done and giving a sign for me that all of the production of the company will be done" (Person B)

"I feel very happy to be busy and in the case of example in using the theory, I use google calender and from microsoft teams to maintain productivity" (Person D)

Also, participants that feel satisfied with the result by the end of the day:

"I could say I felt satisfied and happy in the end of the day, because feeling productive and could finish everything" (Person G)

Nevertheless, there also just feel like normal:

"Well of course, feeling relief is the common feelings after finishing something but it will also depends on the situation and my mood that day" (Person H)

Feelings from each participant shows different personalities on each person dealing with the work situation. The concept theory has proven some of the participants could feel happy and satisfied with helping doing their work but there are also who felt just the same since working could be affected by the mood situation that day and work requires a professional attitude.

Reinforcement

Having reasons could help to pushing someone to do something, the participants shared their reason of implementing the example of the concept theory in work:

"To be a better person and being organized to not mix my free time with work stuff" (Person F) "For me, each day will be more directed" (Person G)

"Personally, to finish before the deadline and not disturbs time outside work, having more free time to be exact" (Person H)

"For everything to be on time and finished well done, also being more organized" (Person I)

Most of the participants wanted to have a more organized work schedule and the example of concept theory could help for achieving it, while Person H mentioned that their reason is for having more free time and not distributing time after work.

Goals

From having something to achieve, goals could appear for giving more internal spirit. The Participants mentioned their goals for having a good work performance by being organized and finish it all before deadlines:

"... for me I hoped that to be more organize and neatly" (Person H)

"For everything to be on time and finished well done, also being more organized" (Person I)

Person H and I have outlined the main objectives when doing work, having organized schedules could increase productivity and create a more comfortable work situation.

Social or Professional Role and Identity

Having goals would not be completed because of support from the others. Supportive environment could create positive work conditions:

"Of course, I think role of surrounding will help to improve the concept theory and as a partners by giving advice to give more influence in work performance of the company" (Person B)

Person G also agreed with the role of partners in work environment:

"Yes, support is one of the important keys that could have a big impact on someone's performance but the real important key is on the internal side. Motivation is the source for every action" (Person G)

The participants shared on the work partners influences in their work life and having supportive surroundings could come from other work partners.

Belief in Capabilities

While having expectations is also believing in themselves, from the reasons has developed into ability for doing work duty. The participants shared their thought on the correlation between having organizing schedule to the goals to obtain the goals:

"Having an organize schedule and supportive partners and usually we use gantt chart to manage the schedule of work task, in the end having a big commitment supported with partners that will give more motivation to reach the goal" (Person B)

"The most affecting part is will be on the incentives of everyone, how anyone taking the situation" (Person H)

Person B and H have given the example of having to trust their ability for reaching the goal in work.

Optimism

Person C explained that being organized from the help of the concept theory could help on increasing work productivity:

"Yes, because this will help to organize and improve the work performance. Creating a consistent habit is a key for having a good work performance" (Person C)

While other participants believe and feel confident, the example of concept theory could help to make better work performance.

Intention

As having goals and confidence will help to achieve the objectives. The participants mentioned that the goals would be their reasons that will inspire them to reach their goals:

"From my goals also that wanted to be organizes and it came from the inside of the someone" (Person H)

"To finish all of my task on time is what my goal that really push me from the inside" (Person I)

Person H and I have mentioned for other participants goals from the objectives for being organized by the example of theory explanation.

Implementation to Improve Work Performance

The main important questions were at the end of the interview, asking the participants' opinion on how the concept theory could help and increase the work performance. All the participants agreed that this concept theory could be implemented and giving their reasons behind it:

"Yes, I would say many of workers will like this kind of method because it is very convenient and easy to use" (Person B)

"Yes of course, I think this is the perfect for improving the work performance plus it is easy to use"

(Person E)

The implementation of the concept theory is longing to help on increasing work performance, but also depending on the preference of someone:

"Yes, this will be a set for someone to have high push because giving an unconscious boost from internal inside of someone, it also could help people with close minded to realize their job desk and increase their work performance" (Person D)

"Yes very much it could be use to everyone, it will be adjustment with preference" (Person I)

Person I has highlighted that everyone has their own likes and dislikes, so the concept theory could be helpful but also not. But the other participants showed their interest and reasons why the concept theory could be used in doing work. This shows the concept theory has a higher possibility for being used in doing work but needed more attention so that it could be known well. Explaining and giving examples could be a good choice for workers to know about the concept theory.

IV. DISCUSSION

From the interview findings of the Push and Pull Theory in the Work Performance there are three categories of questions from Hughes, Williamson and Young (2022). Based on the knowledge of the interview participants from the first part of the category questions of capability, the name of the theory does not seem common and famous. The participants asked the researcher to explain about the concept theory and the researcher gave a brief explanation also with examples from the similarities of 'Do and Don'ts List'. After knowing the explanation and examples, the participants seem to be more assertive because it turns out they have been doing something that has a big impact, the participants gave their opinion using positive and negative impact responding to the example of the theory for doing work, these responds are based on the literature review (Satterlee, 2009, p.170) about the behavior findings based on the participants answer. Most of the participants showed their opinions based on long-term experience just like Jordan (2011) talking about how work duration could create more effectiveness. The second category of the questions is about Opportunity, from the social influence of work partners and the participants and correlated with the literature interview that work partners are one of the biggest supports in work performance. But not only being supported in work, sometimes work partners could also be a hindrance, taking note that it will depend on how someone's interact.

The last part of the category questions was identifying details of the motivation factor that could affect work motivation reflected from Gascon (2017) about work effectiveness being affected by the internal components of an employee. From the answers of the interview participants, there are a variety of factors that are mentioned, through the emotion there were some that highlighted happy and satisfied feelings because finishing the work is the number one priority. Motivation could come from reasons and inspirations, from the interview almost the word 'organized' is mentioned throughout the ending of the conversation. Having an organized behavior is an important factor for workers to be productive and finish before or on time the due date, not only for professional attitude of working but also for giving more free time outside work tasks. Therefore, the concept theory could have high chances to be known and used by workers to improve their work performance. From the literature review of Chowdhury (2016) that showed motivation that being goals and responsibilities, by the work "organized" frequently being mentioned showed most of the participants wanted to obtain to be more organized in their work.

Goals and Intention were taking a lot of importance throughout working and Shanks (2007) has also

mentioned from the literature review that Employees' performance is influenced by their abilities, incentive or ambitions, and the surroundings. As mentioned before, external factors would be unpredictable factors from other people or surroundings for doing work and being connected with the motivation inside the workers that could have different objectives. An organized behavior that is frequently mentioned in the conversation could prevent any unwanted risk from the unpredictable environment. Nevertheless, the environment could also support the work performance by giving a mutual feeling for doing work or reducing workload by helping or dividing work with other employees. Through the interview findings and Chowdhury (2016) discussing the internal motive of workers is an essential component. This also being mentioned in the interview where an intentional could create for someone to believe in what could happen next, positive, or negative. Work activity could be better with the help of theory implementation. Combining the push and pull theory factors with work activities could create a productive balance since the objectives of the theory would be a support for improving work performance and workers could optimize their performance by using from many examples of the theory to the work task.

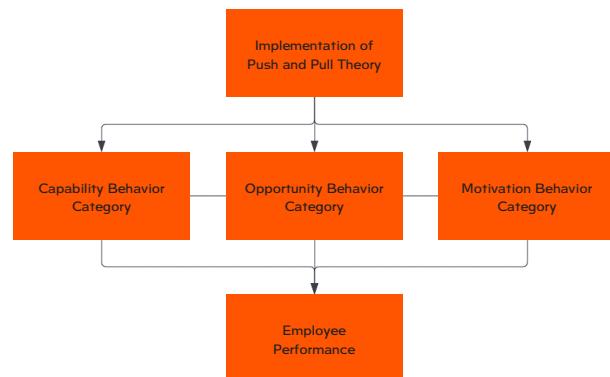


Figure 3: Conceptual Framework

Based on the data collected by interview, the theory along with the answers has developed into conceptual framework. The starting point is where the question of theory being implemented in their daily activities during work. The questions and answers also being categorized into three sections based on the COM-B category (Hughes, Williamson and Young, 2022). Each section of the category represents the performance indicators for that section. After gathering answers from each category question, employ NVivo to evaluate the answers that lead to the main keyword. From the perspective of the employees in the supply chain division, the response appeared positive and implied that the theory could help with the performance to finish their work.

V. CONCLUSION

From the analysis findings of the research study, the important matter that needs to be noted for Push and Pull Theory is in terms of awareness. This has been emphasized from the start of the interview where the participants were not being familiar with the concept theory. The name of the theory seems very formal although it holds many benefits for doing work. It is believed that the concept theory could help for employees to be more organized and create more productivity behavior during work just like what (Maria, 2022) explain that one concept theory could emphasize different result and through the interview responses, they show a positive impact. Any employee could implement the simple concept theory since it has the connection from the motivation inside them. Reasons and inspiration are transformed into goals for employees to do work, each person has different objectives and their own actions. It would be favorable since the main purpose of the theory is to help improve performance. COM-B questions have guided the participants through understanding (Hughes, Williamson and Young 2022) by giving answers and opinion from their capabilities, opportunities, and motivation behavior towards working. The three components cover the possibilities of the implementation of Push and Pull Theory for the employees to use in work and it has been acknowledged by being represented by the participants that come from different supply chain divisions in various companies in Indonesia.

Further finding from different angles of work division also open new perspectives that supply chain process covers almost all the business process. Each division has their important role in the supply chain process, but one thing in common is the goals, environment, and belief for doing the work. Goals have different meanings but leading to one purpose (Rummel and Brache, 2012) also said that Goals in work would then lead to satisfaction aspects, as key to job performance, goals will decide work success. and in the current situation, dealing with the pandemic is also an extra challenge. Environmental components such as work partners is also a challenge since it could be interpreted as positive and negative influence (Brass and Borgatti, 2019). But from the perspective of participants, now the role of work partners as a supportive for doing wrong. There were also participants that mention that being guided by a superior helps a lot in improving work performance and after becoming a superior, passing down the positive side for helping others. This proof that the effect of a person could affect in the end, although it will also depend on the person itself.

The Push and Pull theory have the role also for being a support for employees. From the literature review of Spavey (2016) believed that the "Push Motivation" idea is a force that helps them complete and achieve their goals,

whereas the "Pull Motivation" idea is the perception of acts that they should avoid. Before hearing the explanation or example of the theory, it sounds complicated, but the participants have acknowledged that the concept theory is easy and simple to be implemented, it just needs adjustability for employees to know and could try to use in the workplace, although it maybe has been implemented. Since the example of the concept's theory is as simple as one post it contains a reminder or set of instructions.

Recommendations

The objective of the research is to understand the perspective of the concepts of Push and Pull theory in work and after gathering all the employees' participation in the interview. The participants have given their approval opinions towards the implementation of the theory but there are several notes that could help for the theory to be familiar with:

1. Example of Visualizations

Since the theory is not a common one but most of the employees may have been using one of the simple actions, giving awareness is the first step to help expand the name of the theory to be known. From (Jääskeläinen, 2016) demonstrates that visualizations can perform a variety of ways of improving in performance indicators. The Push and Pull theory could be explained in a simpler version by using the example. Since the concept theory has the similarities with to do list or do and don'ts it could be used for explaining the whole theory. Where the concept is helping to drive the actions that could lead towards goals and certain actions that need to be avoided, for example to avoid the risk of delayed product. Globokar (2020) has identified that visualization has a big power for creating a certain representation and giving an example of the concept theory would be an ideal. Creativity could be used to deliver the visualization to be more attractive.

2. Encouragement to The Employees

Employees will also need motivation since it is also being mentioned by (Satterlee, 2009, p.170) that positive reinforcement could be found by the external and internal components. Here the concept theory could be introduced from superior or work partners, giving advice could help to increase more encouragement to try doing the example choice of the concept theory. Although, the encouragement will come from the inside of the person, but it could be boosted by the influence of surroundings. From Oyedele (2012) mentioned that Supervisors could lead by becoming connected to all workers to understand what motivates them and after having a strong relationship, the environment would be more comfortable, and supervisors could easily give advice or introduce the concept theory

for improving the work performance. Trying every chance for positive influence could be started from one person to another and supported by the environment.

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Paper 59

A Proposed Scheme for Supplier Certification Program
for Non-Private Company

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ICMEM

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Abstract - Supply and supplier management are essential for the sustainable success of a company. The company is more dependent on its suppliers, so effective supplier control is necessary. One of the methods used to control suppliers is through supplier certification and supplier audits. Non-private companies are responsible for providing services to society, so the continuity of material supply from reliable suppliers is crucial to the company's ability to meet customer needs and expectations. This study proposes a supplier certification scheme through supplier audits for non-private companies, particularly those in the public sector services. Literature on suppliers, supplier management, audit, supplier audit, supplier certification, and public procurement are reviewed to develop the proposed scheme. The proposed scheme for non-private companies is developed based on supplier life cycle management, capability and performance of suppliers, and collaboration and building relationships principles. The supplier certification scheme consists of capability audits, follow-through audits, improvement programs and performance evaluation.

Keywords - Supplier, Supplier Management, Supplier Certification, Supplier Audit, Non-private Company

I. INTRODUCTION

Suppliers are essential to a company's supply management, where supplier contribution to value creation and risk for a company reaches more than 50% (Coleman, 2018). Suppliers also have an important role in organizational performance (Prajogo et al., 2012) because a supplier's materials and services significantly impact the company's ability to meet its customer's needs (Monczka et al., 2020). Producing quality products is not enough, a company faces a challenge in delivering the right products and services to customers at the right time, cost, location, conditions, and quantity (Monczka et al., 2020). Supply management requires strategic responsibility aligned with mission and strategy, which impacts the company's long-term performance (Monczka et al., 2020). Based on this, supplier management is one of the crucial aspects of the sustained success of an organization.

Effective supplier management is needed because the company's dependence on its suppliers is increasing (Kannan & Tan, 2002). Prajogo et al. (2012) explained that three supplier management practices are the main elements in supply chain management: long-

term relationships, supplier assessment, and logistics integration. These practices have two essential aspects in supply chain management: selecting the right supplier (who) through supplier assessment and building relationships with suppliers (how) through long-term strategic relationships and logistics integration.

Organizations that focus on developing core competencies will increasingly rely on the quality of the goods supplied and effective strategies by building long-term relationships with their supplier (Arter et al., 2014). Weele (2018) also emphasizes that the success of implementing supplier relationship management depends on how the organization builds collaborative relationships with its suppliers throughout the supply chain.

Non-private companies such as government institutions, regionally-owned companies, and state-owned companies have less flexibility in choosing permanent strategic suppliers because they must follow law-regulated procurement. Suppliers selected for a routine procurement activity (tender or public procurement) may change according to the tender results. The most important public procurement objective is continuity of supply from the best and most reliable source (Abul Hassan et al., 2020). Although public procurement has the characteristics of good legality and public accountability, procurement activity is more procedure-driven, not performance-driven (Weele, 2018). According to Abul Hassan et al. (2020), poor compliance with procurement specifications and lack of supervision are problems in public procurement. Some non-private companies are responsible for providing services to society, so the continuity of material supply from reliable suppliers is crucial (Abul Hassan et al., 2020).

Based on the explanation, how particularly for non-private companies to manage their suppliers through a supplier certification program. So, suppliers have the desired capability level, and products and services supplied consistently meet the company's quality, cost, and delivery requirements. The desired outcome is a non-private company can produce products and services that meet the needs and expectations of society as a customer.

This study proposes a supplier certification scheme through supplier audits for non-private companies, particularly those in the public sector services. The

proposed scheme applies to a manufacturer-type supplier.

The proposed scheme is expected to become insight and discussion in supplier management practices, particularly in non-private companies

II. LITERATUR REVIEW

A. Supplier Management

Supplier management is a critical factor in quality improvement and a way to build long-term relationships with suppliers to achieve quality, lead time, and cost (Fredendall, 2001) Supplier evaluation and certification programs are a way to increase control over suppliers.

According to (Coleman, 2018) supplier life cycle management, shown in Fig. 1, comprise: (1) supplier selection, (2) supplier evaluation, (3) supplier development, and (4) supplier reevaluation. That model is an integrated approach considering business and quality needs and risks. Prajogo et al. (2012) emphasize that assessment and monitoring of suppliers are crucial aspects of supply chain management.

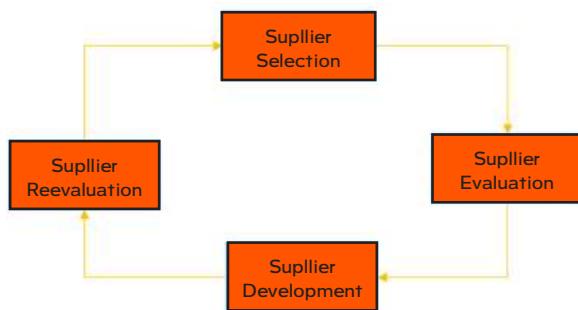


Fig. 1. Supplier Life Cycle Management

Suppliers contribute to supply chain performance, so poor suppliers will affect the performance and ability of a company to deliver quality products and services to customers (Sarkar & Mohapatra, 2006). Capability and capacity are essential aspects of supplier evaluation. The supplier's capability is measured by their consistency in producing products according to the requirements, while the supplier's capacity is measured by their ability to meet customer demands (Coleman, 2018) Supplier conformity can be assessed by testing, measurement, audit, inspection, or examination (ISO, 2010).

B. Supplier Audit and Certification

Audit is a systematic, independent, documented process of objectively obtaining and evaluating audit evidence to determine compliance with audit criteria (ISO, 2018). According to ISO (2018) audit is divided into internal audit and external audit. Internal audit is also called first-party audit, while external audit can be in the form of a

second-party audit or third-party audit.

A supplier audit is a second-party audit where the supplier is audited by the customer or another party contracted by the customer (Kausek, 2006). Supplier audits are carried out because of the contractual relationship between the organization and its suppliers and usually focus on the supplier management system that affects the organization's products or services performance (Kausek, 2006). In supplier audit, processes that significantly affect the organization's products or services are audited in more detail (Kausek, 2006).

Supplier audits are carried out to determine the supplier's ability to meet product requirements, meet production demands, and the effectiveness of the implementation of the quality management system so that supplier audit management can be the basis for improving supplier relationships (Coleman, 2018) Suppliers who are consistently able to provide the highest quality goods will have an impact on increasing operational productivity and reducing costs (Bossert & Raddatz, 2004) Supplier audits can also impact the business where an organization can control the quality of purchased materials and improve communication relationships with suppliers (Bossert & Raddatz, 2004).

Supplier assessment also positively impacts organizational quality performance (Prajogo et al., 2012) The assessment is carried out to assess the capability and performance of suppliers, which are two important dimensions in supplier management (Prajogo et al., 2012) According to Prajogo et al. (2012), supplier capability refers to the potential suppliers that have long-term benefits and advantages for the company, while supplier performance is the supplier's ability to meet the company's purchasing requirements.

Park et al. (1996) define supplier certification as a formal assessment program used to evaluate supplier's systems to assess quality, on-time delivery, and cost conformity. Park et al. (1996) study of United States firms shows that supplier certification program significantly impacts quality, on-time delivery, cooperation, and cost.

C. Non-Private Companies Procurement

Public companies and utilities are attractive to suppliers because of their monopolistic position and high contract value (Weele, 2018) Public authorities usually have specific characteristics of procurement policy and rule. Still, in some public sectors (for example: transportation, water control, electricity, public fuel, and ports), procurement has separated policy and is more flexible (Weele, 2018)

According to Abul Hassan et al. (2020) public procurement faces many problems, including poor specification

compliance, lack of work supervision on suppliers or vendors, poor asset management, insufficient fund, and low-level compliance with procurement criteria. Public procurement is seen as a source of waste and corruption because of many conflicts of interest (Thai, 2001)

Based on the explanation, good procurement rules and procedures are needed to increase trust in public and interested parties and to ensure fair and equitable treatment to all potential suppliers involved in the procurement (Thai, 2001)

III. METHODS

This study uses a theoretical approach based on a literature review. Literature on suppliers, supplier management, audit, supplier audit, supplier certification, and public procurement are reviewed to develop the proposed scheme.

IV. RESULT AND DISCUSSION

A. Supplier Certification Scheme

The supplier certification scheme for non-private companies in Fig. 2 is developed based on supplier life cycle management by Coleman (2018), capability and performance of suppliers by Prajogo et al. (2012) and collaboration and building relationships principles by Weele (2018).

In the scheme, a capability audit, as part of supplier selection activity, is carried out to assess the ability of potential suppliers to produce goods or materials according to the quality, specifications, standards, and requirements of a company. The potential supplier will become registered or certified if they meet the capability criteria and requirements.

Supplier selection is a critical part of procurement because, according to Zeydan et al. (2011) a good supplier can contribute to operational cost reduction and end-product quality improvement. With the capability audit, a company gets registered suppliers with the required capability level, and all suppliers in the supplier base have the same level and standard of capability.

Audit follow-through (AFT) is part of supplier monitoring, conducted when a registered supplier wins a procurement tender. Both Audit capability and AFT are risk-based. An improvement program is a collaborative activity between a company and its supplier to conduct product, process, and management system improvements or innovations to achieve quality, cost, and delivery objectives. Supplier performance evaluation is carried out to assess the supplier's performance when supplying goods during

the certification period. The evaluation results consider whether the supplier is still within the capability baseline of a company.

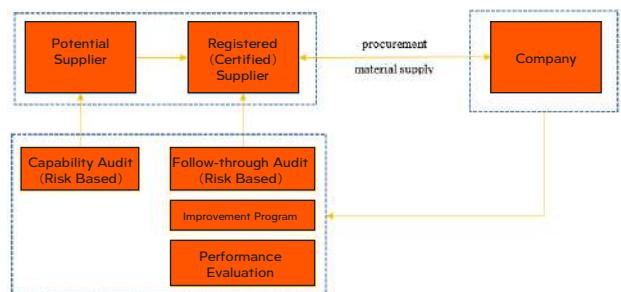


Fig. 2. Supplier Audit Scheme

B. Capability Audit

According to ISO (2015), a capability is defined as an object's ability to produce output that will meet the requirements for that output. The capability audit is a combination of audit and site inspection activities. With the capability audit, a company is expected to get a supplier base that meets the capability criteria to build long-term strategic cooperation.

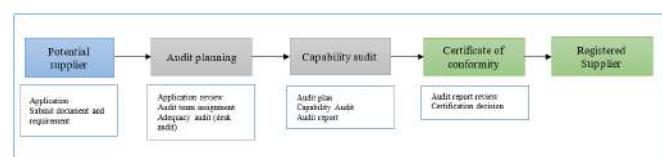


Fig. 2 Capability Audit Flow Process

Fig. 3 shows the capability audit flow process. Potential supplier capabilities are assessed based on criteria, including: (1) management system capabilities; (2) product capability; (3) production capability; (4) quality control capability; (5) top management capability; (6) human resource capability; (7) legal aspect capability; and (8) financial capability.

Table 1 - CAPABILITY AUDIT CRITERIA

Capability	Criteria
Management system	<ul style="list-style-type: none"> - ISO 9001 certificate from an accredited certification body. - ISO 14001 and ISO 45001 from an accredited certification body (for products and processes with environmental, safety, and health risks). - Adequacy of management system documents. - Conformity of management system documents and processes implementation.
Product	<ul style="list-style-type: none"> - Prototype product type test - Product specification - Photo and product design - Raw material list and specification - Supplier list - Prototype research and development record - Product certificate (if any)

Capability	Criteria
Production	<ul style="list-style-type: none"> - Production capacity - Production process and documentation - Contingency plan in an emergency condition - Production infrastructure, tools, and equipment control (feasibility, identification, preservation, maintenance, and calibration) - Production work environment (5S implementation)
Quality control	<ul style="list-style-type: none"> - Quality control process and documentation - Quality control infrastructure, tools, and equipment control (feasibility, identification, preservation, maintenance, and calibration) - Quality control work environment (5S implementation)
Top management	<ul style="list-style-type: none"> - Commitment to supply product - Commitment to comply with the specification, quality, and standard - Commitment to building a strategic relationship - Commitment to support and comply with company value
Human resource	<ul style="list-style-type: none"> - Employee competence - Training program - Employee awareness and engagement - <u>Understanding of related product standards</u>
Legal aspect	<ul style="list-style-type: none"> - Legal and have permits required by law and statutory - Not facing legal problems
Financial	<ul style="list-style-type: none"> - Financial report audited - Health financial condition

The outcome of audit capability is a registered supplier as a company's supplier base. The registered supplier can then participate in the company's procurement activity.

C. Follow-Through Audit

A Follow-through audit is an activity to monitor a supplier's conformance and performance in supplying goods to a company based on communication, openness, and collaboration principles. Follow-through audits are carried out on suppliers who have received procurement contracts. Follow-through audit results as a basis for evaluating supplier performance. Poor incoming material quality from a supplier can incur a cost of inspection, rework and return, purchasing, and overproduction for a company (Chen & Paulraj, 2004).

A Follow-through audit is a risk-based audit and a combination of audit and site inspection activities at life cycle product stages, starting from the production planning to goods receipt. Audit follow-through is conducted to assess the conformity of design, product specification, raw material, production process, quality control, testing, handling, packaging, and warehousing. By follow-through audit, it is expected that the goods received by the company have specifications and quality according to requirements and are delivered in a specified time (on-time delivery).

A Follow-through audit can be considered a risk control activity. Any discrepancy arising during the production of goods that can cause non-conformity in quality, specifications, costs, and delivery requirements can be detected early. Correction and corrective action are taken as soon as possible so that the final product received by the company complies with the established criteria and requirements.

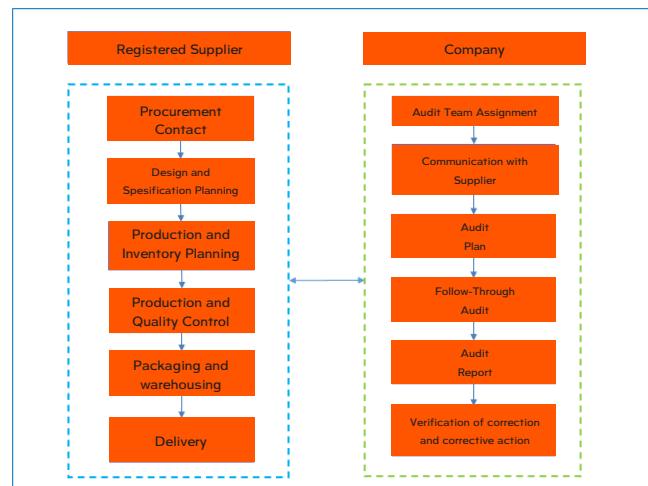


Fig. 3. Follow-through Audit Flow Process

Follow-through audit team conducts audit and inspection during material production: (1) design and specification control; (2) production planning control; (3) inventory control; (4) purchasing process; (5) raw material control; (6) production process; (7) quality control process; and (8) packaging and warehousing.

The follow-through audit is a risk-based basis and sampling. The auditor should take into account: (1) supplier capability level from capability audit result, (2) criticality of material supplied (high-risk product), (3) material quantity, (4) contract value, and (5) previous audit result.

D. Improvement Program

An improvement program is a collaborative activity between the company and its registered suppliers to improve the processes or products supplied. This activity is part of supplier development and collaboration. Ideas for improvement and innovation can come from standard requirements, product development, process development, product or process nonconformities found during audits, and failures found during product use.

Suppliers and companies collaborate to develop improvement plans, execute, verify, validate, and implement improvements in products, processes, or management systems through change management.

E. Performance Evaluation

Performance evaluation is the supplier reevaluation stage. At the end of the certification period, registered suppliers will be assessed for their performance while supplying goods or materials to the company. Evaluation criteria are performance related to (1) specifications conformity, (2) product quality delivered, (3) delivery time, (4) costs, (5) flexibility and responsiveness to change requests, (6) follow-through audit results, (7) participation and involvement in improvement programs, etc.

The assessment results determine whether the supplier is still eligible to extend the certification program and remain as a registered supplier.

V. CONCLUSION

This study gives insight and discussion about supplier certification scheme for non-private companies to manage their manufacturer-type supplier. The proposed scheme is developed at all supplier life cycle stages and based on supplier assessment in capability and performance to build long-term strategic relationships according to (Coleman, 2018; Prajogo et al., 2012; Weele, 2018; Park et al., 1996).

A supplier's capability, as a part of supplier selection, is assessed through a capability audit to ensure that the potential supplier has a level of capability that meets company requirements. A follow-through audit, as supplier monitoring, was conducted to assess supplier performance when supplying goods or materials to the company. As part of supplier development, an improvement program is a collaboration activity to make improvements or innovations in products or processes.

Supplier certification schemes require resources (personnel, time, and money). For optimal benefits and effectiveness, the management of non-private companies should consider the following: (1) alignment and conformity with procurement rules and regulations; (2) develop formal procedures for implementing supplier certification schemes so the scheme becomes part of the company's operational strategy; (3) Management needs to review the categories of materials included in the supplier certification scheme by taking into account material and final product or service criticality, the final products or services impact on the conformity of customer requirements and satisfaction, and material defect level.

This study has limitations because the proposed scheme is limited to non-profit companies with manufacturer-type suppliers. Further research can examine what type or category of material should be included in the scheme so that the supplier certification program can give value and

benefit to a company. The implementation of the supplier certification scheme to other types of companies can also be studied.

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Paper 60

The Framework of Waste To Energy Technology Decision
In Indonesia

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The 7th International Conference on Management in Emerging Markets

Abstract - In 2016 and 2018, the Indonesian Government has issued a regulation through a Presidential Regulation to accelerate the growth of Waste to Energy (WtE) power plant (Pembangkit Listrik Tenaga Sampah, PLTSa). Though, until 2022, there are only two WtE power plant in operation. Several issues have appeared during the process of project development, which is one of the crucial one is determining the suitable technology. Selecting technology to reduce significantly Municipal Solid Waste (MSW) is a challenging effort as many criteria needs to be evaluated. Not only technical aspect during the operation, but also the financial viability and environment compliance of the project which affect the whole MSW management. This study examines the suitability of waste to energy technology to be deployed in Indonesia.

Keywords - development, technology, waste to energy

I. INTRODUCTION

Household waste or more familiar called Municipal Solid Waste (MSW) which is included in the renewable energy category, has interesting prospects to be utilized. Every city has waste that can be utilized to be managed as a fuel supply to power plants. However, the use of waste is not an easy thing. One of the issues is the choice of technology to destroy waste or reduce the volume of waste in large quantities. Variations in the composition of waste are very diverse and cannot be burnt with other solid fuel technologies. Constraints on the choice of technology that can be applied, occur not only in developing countries, but also in developed countries. This is due to many factors that influence the selection of the technology, so it is not easy to implement.

In Indonesia, currently the Waste to Energy (WtE) project is getting priority along with the issuance of a Presidential Regulation which specifically regulates the utilization of waste into electrical energy [1]. This special program needs to be supported by providing studies to understanding and selection of technologies that can be used in WtE. According Indonesian Nationally Determined Contribution (NDC), MSW is the fourth largest of GHG emission source, after energy, agriculture and forestry sector [2]. Thus, preventive measure must be taken immediately to prevent from worse impact of carbon emission.

II. METHODOLOGY

The methodology used in analyzing the framework of waste to energy technology decision in Indonesia is:

1. To review the problem conditions of the development of WtE power plant.
2. Analyzing general waste composition in Indonesia.
3. Implement 3E (Energy, Economic and Environment) assessment method framework for WtE technologies selection.
4. To evaluate the competitive aspects of each technology.

The first step is reviewing the problem conditions of the development WtE power plants in Indonesia, i.e., technical and commercial aspect. Moreover, it also gathers information regarding operation management and commercial issues to establish WtE project in Indonesia. The following step is to evaluate the general waste composition in Indonesia. Then using 3E (Energy, Economic, and Environment) assessment framework for WtE technologies [3]. The data to implement 3E assessment is waste composition, technology operation and performance, capital cost, financial and environment.

III. RESULTS

A. Current MSW Management In Indonesia

The flow of waste material to the final waste disposal site or TPA (Tempat Pembuangan Akhir sampah) starts from households. The garbage that residents throw away in the trash can is unsorted and mixed. In the process of transportation to landfilling in the TPA, the majority of the waste is not treated, such as recycling, or composting [4].

In the process of going to the TPA, the private sector is in charge of collecting waste from trash cans at residents' homes and transporting it to temporary shelters. From this place it is then transported by the city cleaning service officer to the TPA. Garbage originating from residential areas, markets, and offices is temporarily stored in trash bins and then transported by a gradual relay process until it finally reaches the TPA.

Some cities that already have more advanced programs in the field of waste, such as Surabaya, Solo, Jakarta carry out special processes to reduce the volume of waste. The process carried out is by recycling some of the waste material and reducing the volume of waste in the landfill or WtE plant, by converting it into other energy. Based on data from the Ministry of Environment [5], the current heap of garbage in Indonesia is about 28,000,000 ton/year. From this amount, 15% of waste already reduced (Fig. 1).

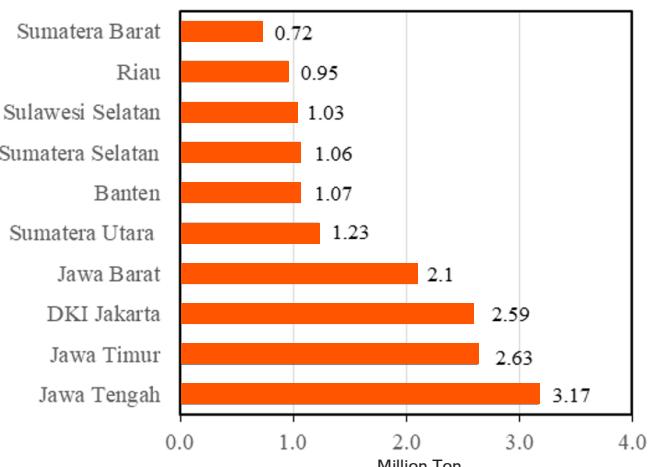


Fig. 1. National Heap of Waste in Several Cities [6]

B. Challenges Of The WtE Development

The few numbers of WtE plant in operation in Indonesia is due to obstacles and problems that hinder its project development. Several Government Regulations have been issued to support this power plant development: the first was in 2012: Minister of Energy and Mineral Resources Regulation No. 4 of 2012 concerning the Purchase Price of Electricity by PT PLN (Persero) from Power Plants Using Small and Medium Scale Renewable Energy or Excess Electricity, and the latest is Presidential Regulation Number 35 of 2018 concerning Acceleration of Construction of Waste Processing Installations into Electrical Energy Based on Environmentally Friendly Technology, but still the progress is below expectation. Technology selection difficulties is one of the main issues in the WtE power plant [8].

Several issues had been raised after the project or program announcement which caused the delay or termination of the project. Another challenge is that the condition of waste delivered to TPA is unsorted and with high moisture content, up to 60%. Furthermore, modern technology to harness waste into energy is considered a new subject, which result in confusion to determine which one is suitable for the available waste in their city.

C. Lesson Learned from The Commercial WtE Projects In Indonesia

1. Suwung 2 MW WtE power plant, Bali

The technology used for this project is landfill gas. Financial factor was the main consideration in choosing this technology. Considering that there was no support for special tariffs for electricity from waste, while the average electricity production rate for PLN and private IPP was lower than 700 IDR/kWh. Suwung WtE had been in operation since 2008, then stopped operating in 2010. This short operating period was caused by the lower estimated revenue than planned. In the initial financial planning, the IPP Company assumed that it would receive income from the sale of carbon credits, but it did not meet expectations. Attempts to obtain a tipping fee from the local government were also unsuccessful, so it was finally decided to stop operating. Regional waste management policies that were not synchronized at that time between districts and provinces also caused the support for providing tipping fees to not be realized.

2. Bantargebang WtE 14 MW, Bekasi

Landfill and thermal technologies are planned to be applied to the Bantargebang WtE power plant. Waste disposal by landfill was built first, and then thermal technology would be developed after the first one. Landfill gas technology construction was started in 2011 and had reached an operational capacity of up to 14 MW, until 2017. Electricity from the Bantargebang WtE with landfill technology is sold to PLN at a rate of 820 Rp/kwh or 9.1 cent at USD/IDR 9000 exchange rate.

At the beginning of the development of the Bantargebang PLTSa, it was constrained by the less-than-optimal gas production from piles of waste in landfills. Foreign experts who are brought in were not able to provide a landfill design that was in accordance with the conditions of waste, soil and climate in Indonesia. But in the end, thanks to the relentless efforts of the Developer, the electricity production capacity of this project was able to reach the optimum according to the electricity purchase contract with PLN, which was 14 MW.

The development of the Bantargebang waste processing capacity with thermal technology had terminated. The contractual issue of waste management between the Bekasi local Government, the Bantargebang Project Owner and the DKI Jakarta Government, as well as the cost of waste processing assistance were the main obstacles to the development of the thermat unit. Waste that was managed in Bantargebang, 5000 tons/day comes from Jakarta and 1000 tons/day comes from Bekasi. The tipping fee received by the WtE Developer only came from the DKI Regional Government. Until this

study was conducted, the electricity production output of the Bantargebang PLTSa still delivered to grid, but continue to decline, and is now below 1 MW. This waste processing project has no longer received operational funding support from the DKI Regional Government.

3. Benowo WtE 11 MW power plant, Surabaya

The total capacity of the Benowo PLTSa in Surabaya is 11 MW consisting of 2 MW with Landfill technology, which consumes 600 tons of waste and 9 MW of thermal gasification and combustion technology, with a consumption of 1000 tons of waste. The sale of electricity from these two technologies to PLN is carried out using two separate PPA contracts. The process to get to the PPA contract has been carried out since 2013. Benowo Landfill WtE operated in 2015, and is still operating reliably. However, Benowo WtE with thermal technology has just been operating in 2021. The main obstacles to the Benowo WTE thermal project are changes in regulations during the procurement process for selling electricity from WtE, including tariff issue which affected to technology decision, discussing PPA contracts and the covid pandemic which caused the construction process to be delayed. In 2021, the Benowo PLTSa thermal technology have started to operate commercially.

Monitoring from the field showed that this WtE project can operate according to the plan, which is to reduce significantly 1000 tons of waste. All air emission parameters comply the quality thresholds that have been set by the Ministry of the Environment. During operation, there were no disturbances due to machine selection errors, or incompatibility with climatic conditions in Surabaya.

In the process of procurement of Power Purchase Agreement (PPA) of the Benowo WtE project, there have been regulatory changes, namely four changes to the Regulation of the Minister of Energy and Mineral Resources and two changes to the regulation of the Presidential Regulation. Perhaps, this project is the only renewable energy project in Indonesia that can still survive during the PPA contract procurement after struggling through six times regulation changes. These regulations, namely:

- o Minister of Energy and Mineral Resources Regulation No. 4 of 2012 concerning the Purchase Price of Electricity by PT PLN (Persero) from Power Plants Using Small and Medium Scale Renewable Energy or Excess Electricity.
- o ESDM Ministerial Regulation No. 19 of 2013 concerning the Purchase of Electricity by PT Perusahaan Listrik Negara (Persero) from Municipal Waste-Based Power Plants.

- o ESDM Ministerial Regulation No.44 of 2015 concerning the Purchase of Electricity by PT Perusahaan Listrik Negara (Persero)from Municipal Waste-Based Power Plants.
- o ESDM Ministerial Regulation No. 50 of 2017 concerning the Utilization of Renewable Energy Sources for the Provision of Electricity.
- o Minister of Energy and Mineral Resources Regulation No. 4 of 2020 concerning the Second Amendment to the Regulation of the Minister of Energy and Mineral Resources No. 50 of 2017 concerning the Utilization of Renewable Energy Sources for the Provision of Electricity.
- o Presidential Regulation Number 18 OF 2016 concerning Acceleration of Construction of Waste-Based Power Plants in DKI Jakarta Province, Tangerang City, Bandung City, Semarang City, Surakarta City, Surabaya City and Makassar City.
- o Presidential Regulation Number 35 OF 2018 concerning Acceleration of Construction of Waste Processing Installations into Electrical Energy Based on Environmentally Friendly Technology.

4. Putri Cempo WtE 5 MW, Solo

This WtE run on gasification technology, which will eliminated approximately 90% of 276 tons waste supplied. The latest progress of this WtE project, i.e, has operated successfully the first stage of engine testing, and planned to start commercial operation by the end of year 2022.

IV. DISCUSSION

A. Waste to Energy Technology

The aim of waste to energy project is to reduced significantly the volume of waste at the disposal area. This technology has similarity to biomass technology in the term of main process as the majority composition of MSW is categorized as biomass. The others materials in MSW may contains elements which can cause corrosion, dangerous air emission in which common biomass or coal boiler is not capable to handle [9].

There are many different types of WtE technology, but three most largely used technologies are thermal conversion, biological conversion and landfilling, as shown in Fig 2. Thermal conversion engines require combustible materials with moisture content less than 60% to be burn completely. Any material with higher waste content need to dried before supplied to furnace. The incoming waste may or may not treated, depending on the capability of the WtE technology.

The thermal conversion process as seen in Fig 2 consists of Incinerator, Pyrolysis, and Gasification. The main difference between the process conditions and the resulting product can be seen from Table I. In the Incinerator, it can consume raw waste, in contrast to gasification which requires pre-treatment of the waste before it is supplied to the combustion chamber.

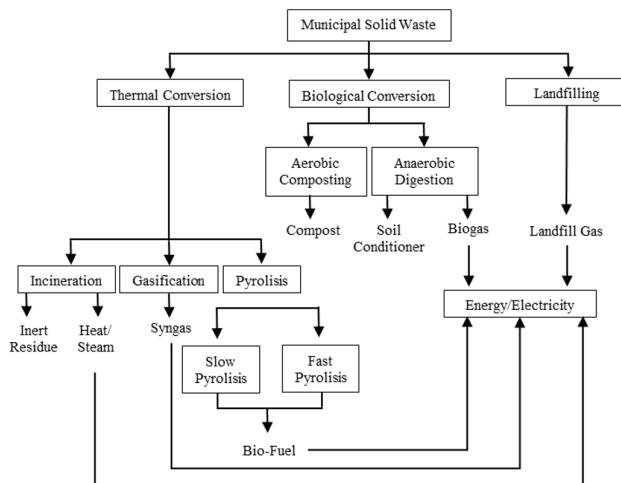


Fig. 2. Municipal Solid Waste Technology [10]

Table 1 - OPERATION PARAMETERS IN THERMOCHEMICAL TECHNOLOGY [10]

	Pyrolysis	Gasification	Combustion
Temperature (°C)	250-900	500-1800	800-1450
Pressure (bar)	1	1-45	1
Atmosphere	Inert/Nitrogen	Gasification agen : O ₂ , H ₂ O	Air
Stoichiometric	0	<1	>1

Gasification and pyrolysis technologies require less air than incinerators to carry out waste energy conversion reactions. Biological conversion is a process based on the decomposition of waste with the help of bacteria. This technique is usually used to treat waste with high organic and water content. If the water content is above 60%, the thermal conversion technology cannot be applied to destroy the waste.

There are two types of waste decomposition using biological conversion, namely composting and anaerobic digestion. Landfilling is disposal of waste on the land which is managed to produce methane gas and controlled the leachate as by product. The capital cost for this technology is the lowest compare to others, but land requirement is the largest.

B. MSW Composition In Indonesia

MSW in the final disposal comes from various sources. Three biggest waste volume is from households, office areas, and market, as seen in the Fig. 3.

Meanwhile, the majority materials in Indonesian MSW are organic, about 58%, which consist on food waste, wood residues, paper and leather. If combustible material is used as categorization, then maximum 88% material can be used as feedstock in the thermal engine. Furthermore, the elements of waste material that can affects energy conversion and equipment lifetime, such as chlorine, potassium, heavy metal may vary among the cities. Water content in the waste material can also play important role to the performance of WtE technology. The new coming MSW could has water content 60%, in which required drying process, otherwise the electricity output from engine will be lower, due to heat loss carried out to stack by water vapor.

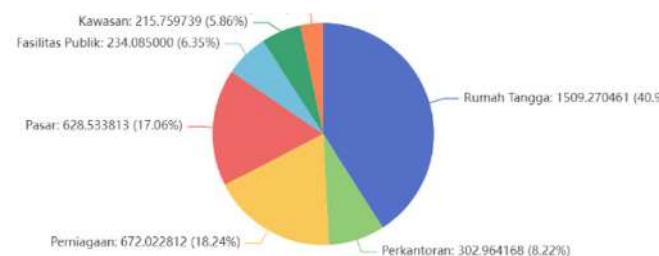


Fig. 3. Source of common MSW in Indonesia [5]

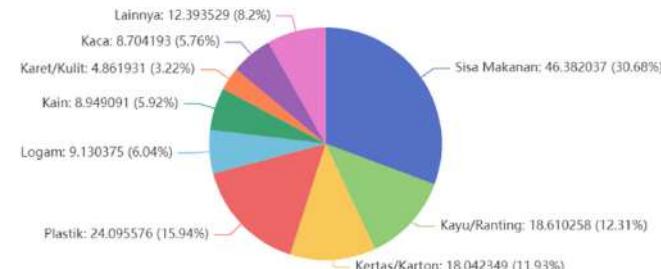


Fig. 4. Waste Composition [5]

Compliance with environment regulation will require MSW to be analyzed detail, not only its composition, and combustible material, but also elements that can generate dangerous air emission, such as dioxin furan, SOx, NOx and acid gas. Even though WtE engines may release environmentally unfriendly flue gas, but high-quality air pollution control equipment will filter this dangerous emission to meet the regulation standard.

C. The Capital Cost for WtE

For the same capacity of WtE, the capital cost varies [10]. The level of efficiency, the air pollution control and the control instrument operation contribute to the final cost of technology. The below table (TABLE II) shows ranges of capital cost for incineration, pyrolysis, gasification, anaerobic digestion and landfilling. For the same type technology, there could be variation in price, which is affected by differences in ease of operation and performance. The country of origin of production also

determines the price of a machine, even with the same brand. This is due to the different production quality. The trend of WtE technology deployment in the world also affected by its capital cost of it. Only high-income countries can have various choices of WtE technologies with high efficiency, as seen in the Fig 4.

Table 2 - COST COMPARISON OF WtE TECHNOLOGIES

WtE Technologies	Capital Cost (US\$/tonne of MSW/year)	Operational Cost (US\$/tonne of MSW/year)
Incineration	400-700	40-70
Pyrolysis	400-700	50-80
Gasification	250-850	45-85
Anaerobic Digestion	50-350	5-35
Landfilling With Gas Recovery	10-30	1-3



Fig. 5. Technology for MSW in the World by Income Level [11]

D. Waste Reduction Capability

Each type of waste to energy technology has different capability of material reduction. They depend on what chemical reaction occurs during the conversion energy process in the power plants and the properties of waste material. The material that can be processed by thermal reaction in short time, less than an hour, could be reduced volume up to 90%. Combustible material may benefit by its properties, which can be burnt and reduced significantly its volume, leaves ashes as inert material. Organic material, due to its high moisture content up to 60% facing difficulties to proceed chemical reaction in the general combustion furnace. However, anaerobic digestion and landfilling technologies decomposed any organic material with high moisture content in six weeks. Another type of technology implemented in waste reduction in Indonesia is RDF (Refused Derived Fuel). However, as RDF technology is categorized as solid fuel preparation, not as energy conversion technology, has limitation to eliminate waste. The factors that hinder RDF to reduce waste in large percentage are technical and commercial aspects. From technical view, the final product standard and drying process would present challenges.

The current Indonesian standard for RDF: SNI 8966:2021 requires organic volume by 90%. Based on MSW composition in Indonesia, there would be many MSW left, as organic waste only contributes 58%. Approximately about 24% of waste will remain at the final disposal which consist of plastic (16%) and others inorganic combustible (8%).

Meanwhile based on RDF project in Cilacap plant, drying process of new waste will last 28 days. This drying times is much longer, compare to MSW drying process in the Benowo WtE, Surabaya, Indonesia, which takes only 5 days.

The commercial aspects challenges RDF is to acquire potential buyer. RDF, as upgraded solid waste fuel, can be fed to boiler of CFPP (Coal Fired Power plant) at certain prerequisite. As the capacity of CFPP in Indonesia varies, there is a concern that RDF production may not be able to supply the CFPP demand at fixed percentages of daily fuel consumption.

Table 3 - PERCENTAGE OF WASTE REDUCTION BY TECHNOLOGY TYPES

Type of Technology	Percentage of Waste Reduction	Type of Waste Can Not Be Reduced
Thermochemical ; Incinerator and Gasification	90%	Inert waste material such glass, metal
Landfilling	50%	Inorganic material
RDF	70% maximum, depends on the standard to produce RDF and the availability of land to produce RDF	It refers to SNI 8966-2021 about RDF, which requires organic volume by 90% in the RDF, thus there are still many MSW left, i.e., 24% consist of plastic (16%), and others combustible (8%)
Biogas	50%	Inorganic material

The second thing is that there is not yet price standard for RDF, therefore the sustainability of this fuel supply chain is questionable as too high RDF price will reduce buyer's interest. Moreover, the RDF buyer should be firmed that their boiler has the capability to burn RDF during the years of operation, without any modification in the boiler. Transportation of RDF product to CFPP plant would be another challenge. As final MSW disposal is located near the city, meanwhile CFPP location is more far away from the city. Therefore, the truck to transport RDF will pass through the main city road. This transportation would need special license from local Government.

E. Framework Of Waste to Energy Technology Decision

Technology suitability studies need to be carried out to

select the appropriate WtE technology. High variation in the content of the processed waste, the influence of the local climate on the water content of the waste, and the emission demands from the waste destruction process are the factors to be considered. Another important factor is the availability of financial support for WtE operations. The higher the financial facilities obtained by the WtE project, the easier the choice of technology, because the options to choose are wider. To simplify the decision of technology selection, 3E (Energy, Economic and Environment) assessment framework is used to analyzed the available information and parameter.

1. Energy

a. Waste Characterization

This analysis is required to understand the quality and the quantity of waste. The resulted analysis data then used to match with the available engine capability and performance based on the proposed MSW. The analysis to carry out, i.e., proximate and ultimate analysis, ash analysis, and trace metal analysis. Then, discuss with technology provider to understand the suitability of waste towards proposed engine.

b. New or Old Waste

The new waste contains high moisture content, up to 60%, particularly food waste. Further drying process may be needed before supplying to WtE thermal technologies. In fact, there is a need to install special drying equipment for new waste as thermal technologies is only capable handling waste with maximum 45% water content [13]. Old waste may benefit in shorter energy conversion process as the drying process already occurred by the assist of sun shining during the open dumping disposal for years. Based on Putri Cempo WtE in Solo, old waste can be fed to gasifier without the need of the drying facility.

c. Waste Reduction Capability

As mention in Table III, each technology has different capability of waste reduction. Though, how much waste should be eliminated also depends on whether massive waste reduction is compulsory or not in the MSW project contract.

d. Waste Processing Time

The period of waste processing, started from the incoming waste at final disposal, up to the final process that generate thermal energy or final product, also have impact on WtE project performance. As new MSW delivered daily to final disposal, any delay or long processing time could increase the waste heap.

e. Net Electricity Sales

Some of the electricity produced from generator, will

be used as internal consumption and the remaining, is delivered and sold to grid. Each technology may have different electricity consumption for auxiliary equipment. The failure to know in detail will affect in the project income.

2. Economic

The electrical parameters of the WtE project are shown in Table IV.

The formula for calculating the Levelized Cost of Electricity (LCOE) is based on equation (1)

Table 4 - FINANCIAL PARAMETER FOR ELECTRICITY FROM WtE

Main Financial Parameter	Unit	Value
Contract Duration	Year	20
Availability Factor	%	80
Debt/Equity		70/30
Cost Escalation	%	3
Interest Rate	%	10
Discount Factor	%	12
Payback Period	Year	7
Income Tax	%	22
IRR	%	14

Where is :

a. Electricity Tariff Sales

$$LCOE = \frac{\text{sum of costs over life time}}{\text{sum of energy produced over lifetime}}$$

$$LCOE = \frac{\sum_{t=1}^n \frac{I_t + M_t + F_t}{(1+r)^t}}{\sum_{t=1}^n \frac{E_t}{(1+r)^t}} \quad (1)$$

Where is :

It : Investment expenditures in the year t, and Mt for Operations and maintenance expenditures in the year t

Ft : Fuel expenditures in the year t

Et : Electrical energy generated in the year t

r : Discount rate, and n for expected lifetime of system or power station

The selling rate of electricity from PLTSa with a capacity of up to 20 MW, based on Presidential Regulation No. 35 of 2018 is 13.35 usd cent / kWh, for a contract period of 20 years. By entering the financial parameters as shown in the Table IV, for the calculation of electricity tariffs, and by using the leveled cost of electricity formula in Fig 5, it is found that the investment of WtE power plant that can reach an IRR of 14% with 13.35 usd cent / kWh tariff is 4 million USD/MW. So that this capital cost of WtE technology

is an indication of the maximum price of electricity from the WtE without financial assistance from any party. If the potential WtE developer decides to choose a technology with capital cost higher than 4 million USD/MW, then other financial support is needed, such as a tipping fee.

b. Tipping Fee

The tipping fee or gate fee is the cost per ton of waste, which is intended as the cost of operational assistance for the WtE project. In developed countries, the percentage of WtE project revenues from tipping is the largest, up to 50%, compared to electricity sales from waste energy [13]. The following Table V provides information on the amount of tipping fees for WtE projects. The amount of this tipping fee is usually related to electricity tariffs. If the IRR on Project value of a project is less than 14%, then a tipping fee is required to ensure the continuity of WtE operations.

c. Project Capacity

Larger engine capacity will benefit from the final price, as there is a discount price per MW. Thus 20 MW WtE generate profit better than smaller one.

d. Land Requirements

Land plays an important role in WtE. Acquisition of land for large projects is not easy, not only the problem of higher land prices, but also the potential for conflict with the surrounding community or the need for permits. High project land prices can reduce financial income.

e. Water

The project developer needs to determine the type of water quality required. Is the water quality demineralized water or just groundwater? This affects the need for investment costs because of the additional costs for water treatment equipment.

f. Delivery Time

High-efficiency WtE power plant equipment requires longer design times. This is conducted to evaluate the suitability of the composition of the waste to the type of machine to be designed.

Table 5 - TIPPING FEE FOR WtE PROJECT

Country	Average Tipping Fee For a WtE Plant (US\$/t)	Average Tipping Fee For a Landfill Site (US\$/t)
Sweden	84	193
United Kingdom	148	153
USA	68	44

Land plays an important role in WtE. Acquisition of land for large projects is not easy, not only the problem of higher land prices, but also the potential for conflict with the surrounding community or the need for permits. High project land prices can reduce financial income.

3. Environment

a. Emission compliance

Emissions from WtE must meet the emission quality standards from the Ministry of Environment Regulation of the Minister of Environment and Forestry of the Republic of Indonesia No P.15/MENLHK/SETJEN/KUM.1/4/2019 concerning Emission Quality Standards for Thermal Power Plants.

b. Ash Disposal or Utilization Planning

Although waste technology is also called zero waste, it still leaves ash which is an inert material so it cannot react and decompose. The amount of ash remaining is up to 5% of the amount of waste supplied to the power plant. WtE planning needs to plan a landfill or utilization of ash from the waste which is the final product of the WtE plant.

c. Leachate (Liquid Waste)

Whether the WtE power plant project produces hazardous liquid waste needs to be discussed with the technology supplier. WtE thermal technology does not produce liquid waste that is harmful to the environment. This is different from the biological, which produce wastewater, namely leachate, which requires a processing unit to purify it.

V. CONCLUSION

The increase MSW at final disposal [5] presents pressure to Local Government to solve it with the most effective measure. Considering the competitive condition for respectively WtE technology will encourage the sustainable MSW Management in Indonesia, as well as supporting the implementation of President Regulation No 35 of the year 2018 concerning Acceleration of Construction of Waste Processing Installations into Electrical Energy Based on Environmentally Friendly Technology.

Technology selection is one of the important steps to develop WtE project [3]. As the availability of technologies varies, which depends on the waste composition and the financial ability, the process to analyze is not easy [8]. Based on best practice in other countries, such as Japan, Sweden, and USA [13], the electricity tariff will determine how much flexibility in technology selection. Each technology has different competitive aspect and crucial issues to deploy. The following Table VI provides competitive condition in which each WtE technology may benefit the most.

Table 6 - COMPETITIVE CONDITION FOR WtE TECHNOLOGY IN INDONESIA

Technology Type	Project competitiveness	Crucial Issues in Operation	Advantages in Operation
Incinerator	Minimum MSW supply is 500 tons/day, available tipping fee and 2 ha land for 10 MW capacity	Air pollution control must be monitored and controlled accurately	Capability to burn all raw waste with various compositions
Gasification	MSW supply is below 1000 tons/day, a tipping fee is necessary if the investment costs cannot take advantages of the economic of scale advantages of the project capacity	MSW must be separated, dried at 20% maximum water content and only handle household waste	Gasification system eliminates HCl and dioxin furan gas pollution without additional flue gas treatment, highest efficiency for the same WtE technology capacity, lower carbon emissions.
Pyrolysis	Waste supply is below 500 tons/day, a tipping fee is necessary in the event that the investment costs obtained cannot take the advantage of the advantages of economies of scale from the project capacity	MSW must be separated, dried at 20% maximum water content and only handle household waste	Capable of consuming up to 100% plastic waste and producing final products which consist of electricity and liquid/solid fuels
Landfill	No target for waste reduction up to 90%, large area available: 1 Ha/MW, the lowest WtE investment cost	Ensure that waste is tightly closed, leachate (waste water) management needed	No need drying process of MSW and less air emission control equipments
RDF	There is no target for waste reduction of up to 90%, 1 Ha/250 ton of waste is available, standby buyers are available who understand the impact of RDF when burned	Ensure the composition and quality of RDF waste according to the standard. Depending on how dry the existing MSW, it may require additional cost to achieve water content target.	Ease of transportation

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Paper 61

The Robotic Process Automation (RPA) and Its Effect on Customer Due Diligence (CDD) Process in A Financial Technology Startup in Indonesia

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Abstract - This paper aims to understand how the Robotic Process Automation (RPA) works and its impact on the online customer onboarding or Customer Due Diligence process in a financial technology start-up. RPA is a popular approach taken by Indonesian-based financial technology companies to reduce the dependency to human agents. The paper uses both quantitative and qualitative methodologies to understand the context, create the time function map, analyze the impact comparison of Capgemini indicators of RPA success by using the data from the case company related to online CDD process, and gain insight for the next improvement. Results indicate that the RPA implementation in the online CDD process of the case company can improve the processing time, SLA achievement level, customer satisfaction, and the compliance. However, it causes the cost increase and quality of work data being compromised. This study provides many benefits for financial companies to learn on how to scale their onboarding fast as long as the company is willing to comprehensively assess the cost and quality of the automation technology before using it.

Keywords - Business Process Reengineering; Customer Due Diligence (CDD); Financial Technology; Robotic Process Automation (RPA);

I. INTRODUCTION

In November 2021, Indonesia had 2,310 start-ups that made it became the fourth country with the biggest number of start-ups after the United States with 69,664 start-ups, India with 11,995 start-ups, and Canada with 3,162 start-ups (Startup Ranking, 2021). As the start-up is designed to grow fast, most of them are disrupting existing businesses through technology (Graham, 2012). One of the start-up sectors that received enormous support from the Indonesian government is financial technology because it helps Indonesia to reach the vision of building a cashless society and financial inclusion (Bank Indonesia, 2021).

To onboard a customer, the financial technology company must enable a customer due diligence (CDD) process through their platform or usually called as Online CDD process. Even if the data has been collected from the online channel, in some financial technology companies, including the case company, there is still human agents that will process each of the collected data and give the approval or rejection decision. The dependency to human

agents makes this process is costly and very hard to scale. Thus, many operational challenges are unavoidable when there's a sudden increase in the traffic because the verification process cannot happen within the service level agreement (SLA) and the cost increases.

One of the feasible solutions to the operational challenge due to increase in traffic is the technology that can remove the repetitive and manual human task. Specifically, robotic process automation (RPA) is one of the technology options. Tripathi mentioned that RPA enables software robots to translate, interpret, respond, and communicate with other systems which will automate the business process (Tripathi, 2018). The RPA disrupts how things are "usually done" in the company. It gives a new perspective on how to do things more efficiently and effectively (Tripathi, 2018). "An RPA tool operates by mapping a process in the RPA tool language for the software robot to follow, with runtime allocated to execute the script by a control dashboard" (Tornbohm, 2017). Hence, RPA tools aim to reduce the burden of repetitive and simple tasks that are usually done by human (Aguirre and Rodriguez, 2017). By having RPA, companies can reduce or even remove some work that will reduce the load of the workers even to cut down the cost of workers in that specific work (Tripathi, 2018). However, it may work to a process and may not work for another process so that in this thesis we are going to assess its implementation and benefit to the company in both the operational and risk side.

Recent studies have shown that RPA gives benefits in various business processes and even selection process criteria has been suggested by some authors. Anagnosse (2019) confirms that RPA is able to solve company's challenges to achieve consistent results in the back office like finance, operations, and human resources. Mononen (2020) enriched the RPA study, not only it gave positive impact on efficiency of the resourcing but also to the more mindful work life that affects the employee engagement positively. Jovanovic (2020) also found that there were some benefits of performing robotic process automation, such as cost reduction, efficiency, and rework task reduction (Jovanovic et al., 2018). This research differentiates itself by bringing the online CDD process in financial technology companies, especially in Indonesia. Thus, the objective of current study was to analyse how the RPA works in the online CDD process, evaluate the RPA success measure comparison for the online CDD process

before and after RPA by using Capgemini indicators, and identify the next business process improvement in online CDD process.

II. METHODOLOGY

In order to achieve its objective, both qualitative and quantitative methodology were used in this research. In-depth interviews were conducted for collecting data to do the qualitative analysis. While the content analysis was used to understand current business process information, the role of RPA in the online CDD process, and the future business process improvement. The in-depth interviews will be conducted with the involved actors, such as product manager, operation manager, fraud manager, and compliance manager, while the content analysis will be performed for internal documents, such as SOP (Standard Operational Procedure), PRD (Product Requirement Document) and technical design. The quantitative method will be done to measure the impact of RPA implementation in the online CDD as well as getting insight for future business improvement.

The research is conducted online through Google Meet or Zoom for the interview, while the documents are received through email. The research period is May 2021 to February 2022. The historical data that will be used is from 1 May to 30 September 2021 for the pre-RPA implementation and 16 October 2021 to 15 March 2022 for the post RPA implementation.

In this research, several methods, such as exploratory, time function map, and quantitative will be used. The exploratory method will be used to explain the background of the business process automation by using RPA in the online CDD process. The time function map method will explain easily then pre and post implementation of RPA in the online CDD process. The quantitative method is used to calculate the impact of the RPA in the online CDD process.

The time function map or process mapping methodology is selected to show the before and after of business process improvement because it is easier to understand in explaining the process and the time required for each process (Heizer, 2020). The time function map is a flowchart with time information added in the horizontal axis (Heizer, 2020). The flowchart is a schematic or drawing of that's used to analyze the movement of products, materials, or people (Heizer, 2020).

III. RESULTS

The case company name was PT Payfazz Teknologi Nusantara with the brand name "Payfazz". It is a well-known financial technology company that provide easiness for its

agents to provide "pay utility" and other financial services through an android-based application. Payfazz vision is to provide digital financial service to everyone, without an exception. While Payfazz mission is to accelerate the digital financial access in the emerging market. In 2021, Payfazz has around 250,000 active agents in Indonesia (Indotelko, 2021). Payfazz conducted online CDD process for its agent to upgrade an account from basic to verified user.

Before enabling RPA, the online CDD process verification happens manually where the customer information was screened by human agents. Post RPA, some technologies were placed to replace human agents, such as blurriness, darkness, and KTP detection check, liveness detection and auto-capture selfie, passive liveness check, OCR (Optical Character Recognition) Dukcapil check, and AML (Anti-Money Laundering) check. As the result, around 70% of the online CDD process went through automation – without human intervention.

The RPA implementation in the online CDD process brings positive impacts to the case company, as can be seen in table 1:

Table 1 - THE CAPGEMINI SUCCESS MEASURE COMPARISON BEFORE AND AFTER RPA IMPLEMENTATION

Indicator	Value	Description
The speed of process	-99%	from on average 156 hours to be <5 minutes
The quality of work data	-2.7%	Defect rate from 1.68% to 4.38%.
SLA achievement level	+55%	within SLA ticket increase from 44% to 99%.
Customer Satisfaction (Calc by using incoming complaint)	-38.7%	from 1,336 to 806
Cost	full ops capacity: +45% normal capacity: -14%	from IDR1,136 to IDR1,650 from IDR1,908 to IDR 1,650
Percentage in standardization	no quantitative measurement	Ops manager mentioned that it has massive standardization impact, bad or good.
Compliance and risk	no quantitative measurement	Compliance and fraud team mentioned that it reduces the identity theft and improve compliance.
Headcount	-41.17%	from 17 to 10 manpower

Based on the interview with KYC lead and the impact comparison above, the quality issue in work data was because of the selfie image filtration is not well-implemented. While the increase in cost is mainly because

there are some additional checks which were not part of the manual process.

IV. DISCUSSION

As displayed in table 1, the RPA implementation in online CDD process gave positive impact towards the case company in term of speed of process, SLA achievement level, customer satisfaction, reduce fraud and improve compliance, and reduce head counts. The speed of process rose by around 99% from on average 156 hours to be <5 minutes. The SLA achievement level also improved by 55%, the within SLA ticket increase from 44% to 99%. The customer satisfaction improvement was shown by the reduction in complaint ticket by 38.7%, from 2,71,336 to 806. The reduction in fraud and compliance improvement were shown by reduction in identity theft to be zero. Enabling anti-money laundering screening and Dukcapil check are also from zero to one feature which weren't enabled before RPA. Last of all, it has been successfully reducing the head counts for online CDD process.

Some negative impacts were also identified due to RPA, such as cost increase and increase in defect rate. Cost increase was unavoidable because enabling the technology through third party will cost significant amount, if operation team was at full capacity, then the cost increase is around 45%, from IDR1,136/application to be IDR1,650/application. The defect rate was increasing by 2.7% in the initial implementation, from 1.68% to 4.38%. While there hasn't been a measurement on "increasing standardization" impact.

In order to improve the negative impacts of RPA, there is a need to improve the image quality input to reduce defect rate and focus on reducing the cost and/or headcounts. On increasing image quality, darkness check, blurriness check, and image ratio check can be added as an input validation so that only good quality ID card and selfie that can go through the RPA. While to reduce the cost, the case company can negotiate to current vendor or find a new vendor as well as shifting as many as possible human agents once unused.

V. CONCLUSION

This paper aims to understand how the Robotic Process Automation (RPA) works and its impact on the online customer onboarding or known as Customer Due Diligence (CDD) process in a financial technology startup by using Capgemini success measures of RPA, such as speed of process, improving the quality of work data, SLA achievement level, employee satisfaction, cost reduction, reducing risk and improving compliance, increasing the percentage of standardization, and reduction in head count of the online CDD process during the period May 2021 to

February 2022. All the data that has been collected were processed to answer the research questions, such as the role and impact of RPA in the online CDD process as well as the suggestion for the future online CDD process improvement.

Though this study, RPA in online CDD at case company has successfully implemented some technology solution (KTP, selfie, and compliance-related check) to automate around 70% of the human agent works. However, brings both positive and negative to the Capgemini indicator of RPA success measure. The speed of process rose by around 99% from on average 156 hours to be <5 minutes. The SLA achievement level also improved by 55%, the within SLA ticket increase from 44% to 99%. The customer satisfaction improvement was shown by the reduction in complaint ticket by 38.7%, from 1,336 to 806. The reduction in fraud and compliance improvement were shown by reduction in identity theft to be zero. Enabling anti-money laundering screening and Dukcapil check are also also from zero to one feature which weren't enabled before RPA. It has been successfully reducing the head counts for online CDD process. However, the cost increase is unavoidable because enabling the technology through third party will cost significant amount, if operation team was at full capacity, then the cost increase is around 45%, from IDR1,136/application to be IDR1,650/application. The defect rate also increases by 2.7%, from 1.68% to 4.38%. While there hasn't been a measurement on "increasing standardization" impact.

To improve the effectiveness of RPA in online CDD process, the case company can reduce the defect rate by adding some validations, such as darkness check, blurriness check, and image ratio check as well as finding out the best price vendor and shift unnecessary human agents. Thus, image quality input can be increased to reduce the defect rate and both human and technology cost will be reduced.

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Paper 62

Design of Information System and Database Management for Pests and Diseases Management

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ICMEM

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Abstract - The agriculture industry in Indonesia will continue to be the country's economy in 2021. Agriculture became a priority in several countries and evolved into one of the businesses capable of supporting the economy. Pesticide is a vital component and has become extensively used in modern agriculture, but with pesticides, especially synthetic chemicals, one must have better control. Most farmers still don't have awareness of the dangers of overuse of pesticides on the environment which can cause greater problems. The farmers also have limitations to access information because there is no integrated information. The research was conducted with the System Development Life-Cycle (SDLC) method to come up with the solution, carried out up to the recommended system design stage. The solution provided recommendations for the use of pesticides that are by pests and diseases experienced. Based on this stage it is known that there are 13 databases needed in creating pest and disease management applications. The implication of this research is to help farmers by reducing costs through the control of pesticide usage and providing integrated information on pests and diseases through the development of new features in Agree Application.

Keywords - Agriculture, Pests and diseases management, Management Information System, System Development Life-Cycle, Database management

I. INTRODUCTION

Agriculture became a priority in several countries, and it evolved into one of the businesses capable of supporting the economy[1]. Indonesia is one of the countries that continue to rely on agriculture to maintain its economy. The agriculture industry in Indonesia will continue to be the country's economic driver in 2020, and Indonesia's coordinating minister of economics hopes that agricultural performance would be even better in 2021[2]. The agriculture industry still faces significant challenges in attaining this pace of development[1]. According to the Coordinator Ministry of Economics, some of the global challenges for the agriculture sector in 2021 include the continued wave of pandemics in several countries, changes in consumption behavior from restaurants and similar places to households, and the disruption of financial technology and face-to-face technology[3]. Climate anomalies, application of technology, demographic

bonuses, regeneration of Human Resources (HR) and food diversification are some of the national problems that Indonesia's agriculture industry should manage[4]. Another challenge that arises is the high operational costs in the planting phase. One of the costs in the very influential planting phase is the cost of pesticides.

Pesticides are synthetic chemicals or biochemicals that use to eliminate pests or diseases in plants[5]. Pesticides itself is including a wide range of substances used to control pests and diseases, it includes insecticides, herbicides, rodenticides, and fungicides[6]. Pesticide is a vital component and become extensively used in modern agriculture to add more protection to the plant, around 45% of annual food are lost due to pests' attack[7] This condition could be seen in the sample of farmers in this research, 100% of them are use pesticides to control and eliminate pests or diseases. Of the sample farmers in West Java – Indonesia, about 63% of respondents are still using chemical pesticides. Chemical pesticides are more effective to eliminate pests than using organic pesticides. But due to the high price of chemical pesticides, there is around 30% started to use combination pesticides between organic and chemical pesticides. The other 7% of respondents already use organic pesticides.

Since synthetic chemical pesticide is the most common pesticide to use on West Java's farms, the synthetic chemicals price becomes an issue for farmers. Due to the review of literature, farmers believe' that performance becomes the most important thing in choosing pesticides[5], [6], [8]. This makes farmers keep using the synthetic chemicals pesticide even the price is relatively higher than biochemical ones. Sample respondents cost at least 5% for pesticide of the total production expenses of they use organic pesticides, and 20% to 70% more of the total production costs if they use chemical pesticides. The other condition that becomes an issue for farmers in West Java, is most farmers still guess how much and when to apply pesticides to their crops, and do not follow the pesticide manufacturer's recommendations[7]–[9]. Farmers usually rely on their senses to determine how much pesticide to apply. Most farmers do not follow the pesticide manufacturer's recommendations. Even though there are explicit guidelines for using certain types of pesticides, farmers frequently have concerns that the pesticides they use are ineffective for their crops and that pests will attack them. Because of their concerns,

farmers frequently use pesticides over the recommended dosage. From the interview conducted there are 90% of the respondent still use their approximation on applying pesticides. Only 10% apply pesticides as its recommendation.

The use of pesticides especially for synthetic chemicals must have better controlled since the pollutants from pesticides can be harmful to the environment and all associated organisms[7], [10], [11]. In the current condition, most farmers still don't have awareness of the dangers of the overuse of pesticides on the environment, which can cause greater problems[9], [11]. The overuse of pesticides could also lead to resistance to pests and diseases[9]–[11]. The pests and diseases were resistant to pesticide drugs and antibiotics due to the adaptation condition, which is the implication of over pesticide usage[5].

The development of pests and diseases management information systems could help farmers reduce the cost of pests and diseases elimination by controlling pesticide usage[9]. Management information systems could benefit agriculture by giving data from a centralized computer database that is constantly updated[12]. Information systems are also useful in gaining a better understanding of an agricultural issue and determining the viability of adopting improvements [13]. Therefore, this research is aimed to help farmers by reducing costs through the control of pesticide usage and by providing integrated information on pests and diseases[12]. To achieve this goal, this research sets the following questions: (i) How to minimize the cost of pests and diseases management? (ii) How is database management developed for pest and diseases management? Apart from helping farmers to reduce costs and control pesticide usage, this research also aims to the development of new feature in Agree Application of Telkom Indonesia, which could give an integrated recommendation for pesticide usage to eliminate specific pests or diseases

II. METHODS

This research uses qualitative methodology by performing a qualitative interview. Qualitative interviews are similar to conversational interviews in that each question is an open-ended question. In this interview, the researcher allowed the participant to explain the situation in the field in their own words [14], [15]. There are two types of data used in this research:

1. Primary data in this research are the result of the qualitative interview involving farmers, agriculture field officers, and other people involved in agriculture. These interview results are the basic benchmark for this research. Particularly to get the outlook of agriculture in West Java

2. Secondary data was obtained by doing the process of compiling and accumulating objects from various sources about this study topic is referred to as collecting. Documents gathered might be tangible or represent a point of view on the environment. Data collected in this research are data about agriculture in Indonesia, agriculture in West Java, and data about pesticides and the management of pesticides from electronic sources and any library sources. These data are collected to support system design for pesticide management.

Through the qualitative interview, the data collected could be used to define the current condition and also issue in agriculture. After the current condition and the issues define, then the next step is to define an information system by doing the analysis based on the System Development Life-Cycle (SDLC).

The System Development Life-Cycle (SDLC) is a phased approach to making an analysis and design that holds systems that are best developed by using the specific cycle of an analyst and user activities[13], [16]. The SDLC done in this research are included in four four-steps define in the figure below:

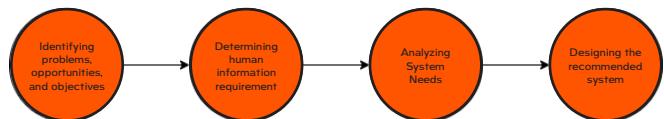


Fig 1. Research Methodology

Adopted from SDLC Method (Kendall & Kendall, 2011)

III. RESULTS AND DISCUSSION

Identifying problems, opportunities, and objectives

Identifying problems can be done by using gap analysis and root cause analysis. Through the gap analysis, it could be seen that there are still some gaps between the current condition and the ideal condition. In the current condition farmers only use their experience and knowledge to eliminate pests and diseases. Farmers use their observations to determine pesticide dosage; farmers are dependent on a specific brand of pesticide, and farmers use the pesticide depending on the brand; farmers are unconcerned about the active chemicals in the pesticide. The ideal condition Farmers in ideal conditions should be looking for pest and disease recommendations. Farmers can also easily obtain information on the types of pests or illnesses, pesticides to be used to treat them, and pesticide dosage recommendations. To use the pesticide properly, farmers must follow the prescribed dosage instructions on the label, and they must also comprehend or be aware of the active components in the pesticide, which vary based on the brand. According to

the findings above, the gap between them is a limitation of knowledge for pests and diseases management, access to recommendation channels, and integrated pests and disease management information system.

The root cause of the issue of today's agriculture in West Java that has high costs during the planting phase is the farmers still have limitations to access the information, and there are no integrated platforms or applications that could give diseases and pests information and specific volume recommendation of pesticide dosage to use. Based on the root cause analysis that has been done, there is an opportunity for companies to develop an application using a database system. The database system in this application serves to bring together data on diseases, pests, and pesticide use from various sources. Due to the root cause analysis result, the objectives of this research are to determine the management information system database to develop for pests and diseases management. The result of the database will give specific insight into the data needed to develop an agriculture application. Before we identify the system for pests and disease management, first we need to identify the user of this system. Since this research is focused on the agriculture sector, and the issue that occurs is the high costs in the planting phase, then this system is made for farmers. But not only the farmers who will involve but also farm equipment sellers, and also farm support staff in this case field assistants.

In this step, it also could be concluded what kind of system is needed in the planting process of the agriculture sector. This research defines farmers' system needs fully through the interview process directly with the farmers.

Determining Human Information Requirements

The difference between the proposed business process and the current business process is that in the current business process, all of the processes were done by the farmer and were done based on the farmer's experience and knowledge, whereas in the proposed business process diagram, Agree Application will assist the farmer by recommending pest and disease management. Farmers must enter data required by Agree as the initial step in the planned business process. Farmers must enter data into the Agree Application during this business procedure. Following the input of the signing-in data, the farmer should enter the data of their farm controlling process, which includes farm conditions and the pests and diseases that occur on the farmer's farm.

The farmer enters this data into the Agree Application, and Agree receives and analyzes the farmer's data. Agree's analysis focuses on the pests and diseases discovered on the farm, as well as the strategy for eliminating these

pests and diseases. All of the analysis data were given to the farmer as well as the field officers who worked with him. Agree's recommendation is for an appropriate pesticide's active component that can eliminate pests and diseases and a dosage recommendation based on the pests and diseases attacks experienced.

Referring to the Agree's suggestion, farmers purchase the pesticide as directed. The farmer might purchase pesticides based on the active components or any available brand. Following the purchase, the farmer might spray their farm under the supervision of field officers. Field officers are advised to provide supervision in the suggested business process to reduce errors in the pesticide spraying procedure.

Analyzing System Needs

In this research, analyzing the system requirements is a stage in which a business process is decomposed, a context diagram is created, and a data flow diagram is created. Before creating the data flow diagram, first, it needs to know how the big process of the system until the system could give results to the farmers. In this research, the big depiction of the process is defined below.

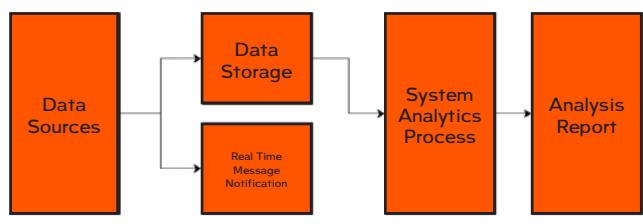


Fig 2. Data Architecture

After the data architecture of the system defined, the system need context diagram to get a more detail depiction of the system. The context diagram is used to see the entire picture of the system's input and output. Following the completion of the context diagram, the data flow diagrams are depicted, beginning with the highest level, level 0, and progressing to the smallest level. Simply said, context diagrams and DFDs are used to visualize problems in the system under consideration from the input, process, and output sides.

The current business process must be decomposed before creating a context diagram and DFD. Processes are decomposed by defining the function into more detailed processes and sub-processes

Table 1 - Business Process Decomposition

Process	
Planting Phase	Pests and Diseases Management System
	1. Sign-in into Application
	1.1 Input Farmer's Identity Data
	1.2 Input Farm Identity Data
	2. Pests and Diseases Detection
	2.1 Farm Controlling
	2.2 Input Data Farm's Pests / Diseases Found
	3. Looking for Recommendation Pests and Diseases Solution
	3.1 Input Data Required
	3.2 Analyzing Farm Condition
	4. Pests and Diseases Recommendation Solution
	4.1 Make Recommendation
	4.2 Give Recommendation
	5. Spraying Pesticide
	5.1 Receive Recommendation
	5.2 Buy Pesticide as Recommended
	5.3 Spray Pesticide
	5.3.1 Looking for Weather Recommendation
	5.3.2 Decide time to Spray
	5.3.3 Make Pesticide Mixture
	5.3.4 Decide the best way to apply pesticide

From the process decomposition table above, 5 main processes are Sign-in into the application, pests and diseases detection, looking recommendation pests and diseases solution, pests and diseases solution recommendation, and spraying pesticide. Every step is divided into other subprocesses to make the process clear. After the process of decomposition from the pests and diseases management system, the next step is to make the context diagram from the system.

The making of diagram context is to get a picture of a system environment that would be included in the research. As can be seen in Figure 5, external entities are involved in the pests and diseases management system from Agree, namely Farmers, Field Officers, Vendors, Saprotaan (Means of Agricultural Products) Providers, and Weather Forecast

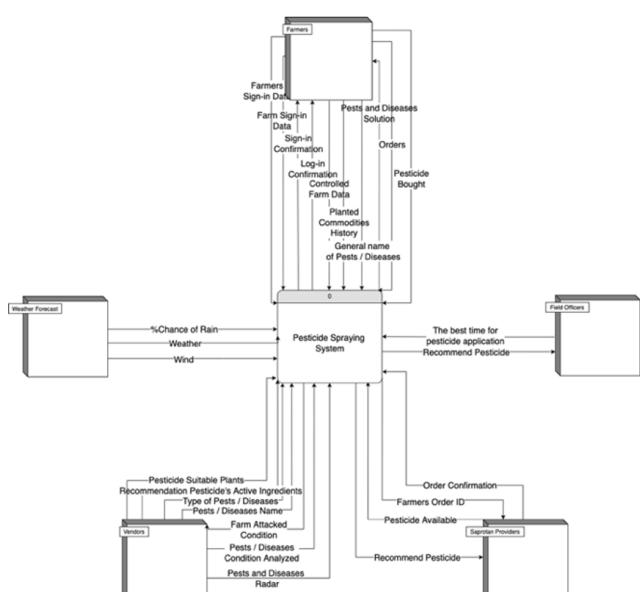


Fig. 3. Context Diagram

As can be seen in figure 4 above, Farmers will give data of farmer's sign-in data, farm sign-in data, farm controlling data, planted commodities history, a general name of pests/diseases (if only farmer know) and pesticide bought. These data will be helpful in the making of the pests and diseases solution recommendation which will be detailed in the DFD section.

The next process is the data will be processed on the system and given to vendors. Vendors will receive the data about attacked farm conditions, then the vendors will give data to the system about the type of pests and diseases, pests/diseases names, pests/diseases condition analyzed, pests/diseases radar, pesticide suitable plants, recommendation pesticide's active ingredients.

The recommendation pesticide's active ingredients will be processed in the system and given to the saprotaan providers. Saprotaan providers will give the data about pesticides that are available with that kind of active ingredients. This information will also process in the system then it will give the pests and diseases solution to the farmers which inclusive of the pests/diseases analyzed data and its pesticide available solution. The pests and diseases solution is used by the farmers to buy pesticides in the application or manually in the saprotaan providers. The recommended pesticide data will also be given to field officers, then field officers will process the data to give the data about the best time for pesticide application. To support the recommendation solution for pests and diseases, there is one external entity of weather forecast that supports the data of forecast weather. The data that will be provided by the weather forecast entity is the data about the %chance of rain, weather, and wind.

Pests and Diseases Spraying Management System consists of several processes and several subprocesses as can be seen in table 1 DFD depiction is useful to get a more detailed picture of the process carried out and the flow of data in each process on the system.

The first process is a sign-in into the application process, this becomes important because it is the first process for farmers to be able to use pests and diseases spraying management system services. In this process, farmers provide farmer sign-in data as well as farm sign-in data, which will then be stored in a farmer's identity database and farm's identity data store. Farmer's identity datastore will contain the username, name, ID number, email address, and address. While Farm's Identity data store will contain about regular commodities planted by the farmer, location, altitude, land area, and average soil condition. After this process, the system will confirm with farmers the results of the sign-in, and confirmation regarding logging in to the Agree application.

The second process is pests and disease detection. This process requires farm-controlled data derived from farmers, log-in confirmation data, and agricultural location data. Then the data will be processed in the pests and diseases spraying management system and become the following data, planted commodities data, plant condition, plant characteristics, and plants age. This data will be stored in the farm's current condition data store. In addition to the data, the results of data processing on the system will also produce data commodities attacked, location of ion pests/diseases found, and characteristics of pests/diseases found. These data will be stored in plant attacked datastore, this data will be present when pests or diseases are found in data from farmers. The system will also issue a data farm's condition result that contains conclusions from the agricultural condition

The context diagram above is a depiction of data input and output from the entities and also from the systems. After done the context diagram, the next step is to define each process with a data flow diagram. The data flow diagram will detail every data input and the data output from the process of table 1 (decomposition of a business process).

After the DFD of each process is created, then the final step of this research using SDLC is designing the recommended system. The next step is database design, which depicted the Entity-Relationship Diagram (ERD) and normalization database.

Table 2 - Database Design

Farmers Sign-in	Farm Sign-in	Pests/Diseases Solutions
Username	Location	<u>Suitable Pesticide</u>
Email Address	Username	Recommendation pesticide's active ingredients
Name	Altitude	<u>Pesticide Code</u>
Address	Land Area	<u>Type of pesticide</u>
		<u>Dosage Recommend</u>
	Regular Commodities	Pesticide function
	Soil Condition	Price
		Producers
		Pesticide Application
		Usage Guidance

The ERD show relationship from each database in the pests and diseases management system. The proposed pests and diseases management system has 13 Databases in total, each database has a relation one to one or one to many to another database.

To identify whether this information system is appropriate for users, the researcher did an interview process with the doer in this case farmers, and a direct field assistant. To ensure all of the information systems are usable and could support the agriculture sector.

IV. CONCLUSION

Through the analysis in this research, and root cause analysis done with the 5whys root cause analysis tool, the root cause in the pests and disease management is The farmers still have limitations to access the information, and there is no integrated platform that could give diseases and pests information and exact volume recommendation of pesticide dosage to use. The available resources of information in the current environment are still independent or separated from one another. It makes farmers have an unclear solution, for specific pests or diseases experienced. The implication of this research is to help farmers reduce the operationalist for pests and disease management. With the technology in the agricultural sector, it hopes could improve the welfare of farmers and increase production efficiency. The benefit of implementing a management information system is it could help the farmer by providing accurate recommendations and information.

The Pests and Diseases Management Information system analyzes the data and recommends pesticide usage for specific pests and diseases experienced by farmers. The recommendation on what type of pesticide, how much the pesticide is to be applied, and when to apply it. This feature can also provide information on pests or diseases that are attacking the area around farmers, as a measure to prevent farmers from getting pests and diseases that are rife in the surrounding area

The findings of this research are 13 databases on database management for pests and diseases management in this research. The development of these databases is based on previously generated data flow dofAllms. All data that enters, processes, and outputs at every action in the pest and disease control system may be observed using a data flow diagram. This information may be seen in the data flow diagram, which begins with the highest level, namely level 0, and progresses through sub-processes for data flow diagrams with lower levels, namely levels 1 and 2. An entity-relationship diagram is developed to guarantee that every data entered, processed, and output from the system has a relationship with one another. After the entity-relationship diagram has been finished, the next step is to ensure that there is no data repetition and that a database already fulfills the standard. This could be done by doing the normalization database for each entity.

The recommendation for future research continues to the next step which is developing and documenting software, testing and maintaining the system, and implementing and evaluating the system. To make the database management and farmers could use the feature. in the agriculture application, and continuing to develop pests and diseases management features from developing

software until implementing and evaluating the system.

The implication of this research is to make costs for the planting phase effective, the decreasing volume of using pesticides, and makes it easier for farmers to determine the right type of pesticide so that the use of time is more efficient in the planting phase.

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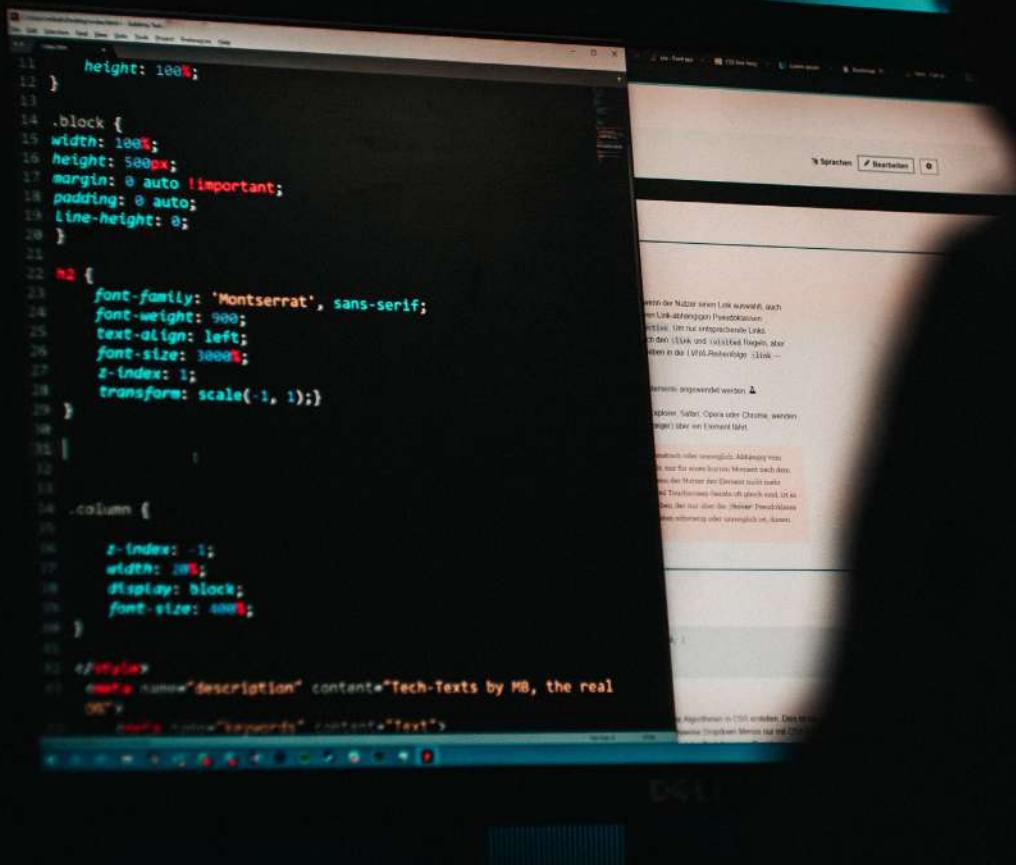
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A close-up photograph of a person's hands typing on a white laptop keyboard. The laptop screen displays a Sublime Text code editor with a dark theme. The file being edited is `game.directive.coffee`, which contains AngularJS code for a game directive. The code includes imports for `$rootScope`, `$log`, `LEVELS`, `BOARD`, `SHAPE`, `GameManager`, and `Watcher`. It defines a directive named `'scGame'` with attributes like `templateUrl` and `restrict`. The code also includes logic for handling game states such as `gameType`, `difficulty`, and `attempts`. A `link` function is defined to initialize the game object and set up event listeners for various game events like `onNewGame`, `onResetGame`, and `onQuitGame`. The Sublime Text interface shows a sidebar with project files and a status bar indicating the file path and date.

```
use strict';

angular.module('app').directive 'scGame', [
  '$rootScope'
  '$log'
  'LEVELS'
  'BOARD'
  'SHAPE'
  require '../services/gameManager'
  require '../services/watcher'
  ($rootScope, $log, LEVELS, BOARD, SHAPE, GameManager, Watcher) =>
    templateUrl: 'components/game/game.html'
    restrict: 'E'
    scope:
      sourceName: '?'
      gameType: '?'
      difficulty: '?'
      attempts: '?'
      modalShow: '?'
      triggerGamePause: '?'
      onNewGame: '?'
      onResetGame: '?'
      onQuitGame: '?'
    link: ($scope, el, attrs) =>
      # Globals
      game = null
      $window = $(window)
      gameHeader = el.find('.game-header')
      watcher = new Watcher( $scope )
      $scope.showWinModal = false
      $scope.showLossModal = false
      $scope.showPauseModal = false
      $scope.isFirstInit = true
]
```





A screenshot of a computer monitor displaying a code editor on the left and a web browser on the right. The code editor shows a portion of a CSS file with rules for .block, h2, and .column elements, and an HTML file with meta tags for description and keywords. The browser window shows a webpage with German text about link styling.

```
11 height: 100%;  
12 }  
13  
14 .block {  
15 width: 100%;  
16 height: 500px;  
17 margin: 0 auto !important;  
18 padding: 0 auto;  
19 line-height: 0;  
20 }  
21  
22 h2 {  
23 font-family: 'Montserrat', sans-serif;  
24 font-weight: 900;  
25 text-align: left;  
26 font-size: 300px;  
27 z-index: 1;  
28 transform: scale(-1, 1);}  
29  
30  
31 .column {  
32 z-index: -1;  
33 width: 20%;  
34 display: block;  
35 font-size: 400px;  
36 }  
37  
38 //meta  
39 meta name="description" content="Tech-Texts by MB, the real  
MB"  
40 meta name="keywords" content="text">
```

Paper 63

Customer's Cybersecurity Awareness in Indonesian Online Clothing Micro, Small and Medium Enterprises

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ICMEM

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Abstract - In the current technological era, almost every business operation and transaction are conducted through cyberspace, including micro, small and medium enterprises (MSME). However, MSMEs pose the greatest vulnerability to cyber-attacks due to their limitation in both awareness and resources. Multiple research found that people significantly affect cybersecurity more than the technical aspect. Thus, making cybersecurity awareness vital for every business, especially MSMEs. Currently, most cybersecurity awareness research is focused on the perspective of MSMEs and their owners. Limited cybersecurity awareness research assesses MSMEs in Indonesia, especially in the online clothing sector. This research will contribute to assessing cybersecurity awareness from MSME customers' perspective and aims to recommend Indonesian online clothing MSME environment to raise cybersecurity awareness. The researcher used a survey and a semi-structured interview to assess the overall cybersecurity awareness of Indonesian online clothing MSME customers. The semi-structured interview also explored respondents' opinions on raising cybersecurity awareness in the Indonesian online clothing MSME. The result shows a variety of levels of cybersecurity awareness among respondents. Correlation tests were conducted and found several aspects that were affecting respondents' cybersecurity awareness. The interview results also support the findings in the survey whilst also contributing to providing recommendations to raise cybersecurity awareness.

Keywords – Customers, Cybersecurity, Cybersecurity Awareness, Cyber-attack, MSME

I. INTRODUCTION

Almost all businesses, including micro, small and medium enterprises (MSME) in Indonesia, are conducting business operations and transactions through cyberspace. Making up 99.99% [7] of businesses in Indonesia, MSMEs play a strategic role and are the most resilient sector in the country [16]

According to [20], Indonesia's internet penetration rate in 2017 was 51%, making it the third-largest Asia-Pacific region. MSMEs in Indonesia are seen utilising the opportunity and shifting their businesses online. Research by [15] projected that Indonesia's online economy will grow to \$146 billion by 2025. However, cybersecurity

threats will also be expected to grow significantly. Referring to research by Kaspersky in 2020, there were 192,000 recorded cyberattacks on Indonesian MSMEs [34]. Thus, making cybersecurity an essential factor for every business managerial consideration.

Contrary to popular belief, people significantly affect cybersecurity more than the technical aspects. Maria Vello in [23], a former CEO of Cyber Defence Alliance, says people are the weakest aspect of cybersecurity. Vello also argued that technology is not enough, and behavioural change is needed. Similarly, [29] found that people can be a weakness in cybersecurity, yet can be the first line of defence against cyberattacks with adequate training. However, MSMEs are vastly exposed to cyber-attacks due to their limited awareness and resources. [19] argued that the primary resource limitation is the organisation's budget, management, employee support and commitment toward cybersecurity. Additionally, MSME owners believe that their business is too small or not worth being attacked by criminals [29]. This is where cybersecurity awareness implementation is needed.

Referring to (European commission) [2] argue that losing company data, especially customer data, is a significant concern for many businesses. According to [5] businesses could suffer financial loss, reputation damage, regulatory intervention, business disruptions and customer liability if cybersecurity is breached. Moreover, cybercriminals often steal millions of credit card and personal data from customers by exploiting a security flaw in any computer with an internet connection [25].

A. Research Contribution

Previous research shows that effective cybersecurity awareness comes from the user's perspective and decision-making process [21]. Based on the Information Processing Model study, threat detection happens involuntarily and without awareness [26]. Therefore, awareness needs to be triggered so people can move to the second stage of the Information Processing Model, where human's primary responses to threats are activated. Hence, Online Clothing MSME customers can focus on reacting to cybersecurity threats [4]. When customers understand how to react to cybersecurity threats, MSME owners will also react by ensuring that their business is cyber-safe to ensure they don't lose their customer's trust. Hence, raising cybersecurity awareness is essential

to improve the online MSME in Indonesia, especially in the clothing sector.

Currently, there is limited research in Indonesia that explicitly assesses cybersecurity awareness towards MSMEs, especially in the clothing sector. Understanding that cyberattacks on businesses, especially MSMEs, could also affect the customers, this research will assess the customers' perspectives. This research also aims to provide recommendations to raise cybersecurity awareness in the Indonesian online clothing MSME environment. Furthermore, this research could also be a foundation or guidance for further research to develop plans for improving the cybersecurity environment in Indonesian MSME.

B. Indonesian Online Clothing MSME

The researcher focused on assessing the Indonesian online clothing MSME based on observation of the researcher's environment, where many people started an online clothing business during the Covid19 pandemic. The researcher saw this as a business with a low entry barrier as most business processes are conducted online. Supporting this observation, a 2020 Indonesian National Bureau of Statistics research shows that clothing is the third largest MSME sector, accounting for 14.05%, just after food & beverages and wooden industries [6]. The same research also found that clothing MSME is the second largest internet user after the food & beverage sector in the whole MSME environment, with 22.66% [6].

C. Definitions

Based on Indonesian law number 28 of 2008, the criteria for micro, small and medium enterprises are explained in the table below

Table 1 - CRITERIA OF MSME IN INDONESIA

* Based on the exchange rate at 4th May 2022

Type	Minimum Asset (Rp)	Maximum Asset (Rp)	Annual Sales Revenue (Rp)	Annual Sales Revenue (€)*
Micro		50,000,000	< 300,000,000	< 16,500
Small	50,000,000	500,000,000	300,000,000 – 2,500,000,000	16,500 – 137,500
Medium	500,000,000	10,000,000,000	2,500,000,000 – 50,000,000,000	137,500 – 2,750,000

According to several resources [22][28][18], the definition of cybersecurity has emphasised an action to protect or defend from the risk of cyberattacks. At the same time, awareness is defined by [9][35][3] as an understanding or knowledge of a given situation. Hence, cybersecurity awareness means activities that focus individuals'

attention on cybersecurity issues, allowing individuals to recognise cybersecurity concerns and respond accordingly.

D. Types of Cyberattack

A cyberattack is an attack via cyberspace, targeting enterprises' use of cyberspace to disrupt, disable, destroy, or maliciously control a computing environment/infrastructure, destroy the integrity of the data, and steal controlled information [22]. Combining research from [10][12][13], eight types of cyberattacks mainly occur to MSMEs: Hacking, Virus, Ransomware, Spyware, Denial of Service (DoS), Phishing, Identity theft and DNS Tunnelling. The table below will explain the definition of each type of cyberattack.

Table 2 - DEFINITIONS OF CYBERATTACKS

Types of Cyberattack	Definition
Hacking	Hacking is an activity that compromises the confidentiality or integrity of a system. It requires a certain skill and involves exploiting the system's vulnerability to break into the system [24].
Identity Theft	Identity Theft is when the attacker pretends to be a different person to gain financial benefits [31].
Phishing	Phishing attempts to convince the victim to act on the pretence of engaging with a legitimate party [24].
Virus	A virus is a computer program that can copy and infect a computer without the user's permission or knowledge. A virus can then corrupt or delete data on a computer, use email to spread itself to other computers, or even erase everything on a hard disk [22].
Spyware	Spyware is still considered Malware, specifically designed for information gathering from its victim [22].
Ransomware	Ransomware. An extortionate Malware locks a user's data to get payment for unlocking the data [31].
Denial of Service (DoS)	Denial of service (DoS) or Distributed Denial of Service (DDoS) is an attack that floods systems, servers, and networks with traffic to exhaust resources and bandwidth. This eventually results in the system being unable to process legitimate requests [32].

Types of Cyberattack	Definition
DNS Tunnelling	DNS tunnelling works by packaging data into DNS packets to be sent in a query for a specific domain [37]. It is exploited by embedding illegal data packed as a legitimate DNS packet. DNS traffic can travel across the network without interference because the hosts often trust the information of DNS queries [36]

E. Human Factors in Cyberattacks

After understanding the various types of cyberattacks, the human factor is a crucial part that attackers often exploit. For instance, viruses that need an execution order from the victim before causing damage [31] and when Malware enters the victim's system by clicking a malicious link from email attachments or installing risky software [32]. Vello further argued with [23] that no technology could stop social engineering or human nature. [17] further explains that attackers increasingly target humans as they are often seen as the weakest link in the system.

F. Measures to Protect from Cyberattacks

This research will use the combination of various cybersecurity measures provided by The U.K. National Cyber Security Centre (NCSC) and The Indonesian Ministry of Communication and Information. The suggested cybersecurity measures can be seen in the list below:

1. Avoid using public Wi-Fi as much as possible, especially when accessing sensitive information [27]
2. Use antivirus, turn on the firewall and regularly patch & updating the software to avoid malware damage [27]
3. Don't open a link or attachment from unknown sources [27]
4. Periodically changing passwords, using special characters & irregular sentences and using a password manager [27]
5. Shop only from trusted brands with positive reviews and security icons [13]
6. Avoid sharing personal information by using a fake name or a fake email address [13]

G. Related Literature

Several related works of literature have been conducted to assess cybersecurity awareness [30] listed 24 articles in his paper "Systematic Literature Review of Approaches to Assessing Cybersecurity Awareness". The researcher chose five research that is related and applicable to this research shown in the table below

Table 3 - RELATED LITERATURE

Based on (Rahim et al.)

Author(s)	Objective	Scope of Assessment
Furnell et al. (2007)	To identify internet users' awareness of cyber threats and their understanding of the methods for protecting and safeguarding data and systems over the internet	Level of cybersecurity awareness
Rezgui and Marks (2008)	To explore the level of information security awareness	Cybersecurity in general and the level of cybersecurity awareness
Furnell et al. (2008)	To provide a rich source of users' experiences and views regarding internet security and issues of online protection	Cybersecurity in general
Furman et al. (2012)	To identify the correct perception, myths and potential misperceptions about computer security	Cybersecurity in general

II. METHODOLOGY

A. Research Design

This research used a mixed-method of survey and semi-structured interview. The survey enabled the researcher to assess the cybersecurity awareness of a large customer population. In contrast, the semi-structured interview provided a deeper understanding of the respondent's view on cybersecurity awareness, which eventually generated recommendations to raise cybersecurity awareness for the online clothing MSME customers in Indonesia.

B. Data Collection

The survey consisted of 20 questions, first asking the respondent's agreement with the research ethics disclaimer. The other 19 questions are demographic questions, online shopping frequency & cybersecurity familiarity, familiarity with eight types of cyberattacks, and cybersecurity implementation.

The semi-structured interviews were conducted through Google meets and WhatsApp video calls. The interview audio was recorded with prior agreement from the

respondent. The respondents were presented with 21 questions that were divided into six different sections according to the question's objectives. In addition, probing questions were asked during the interview to clarify the respondent's answers or to explore new ideas generated by the respondents.

C. Sampling Technique

The survey sample was any Indonesian aged 17 and over who had experience purchasing a clothing item from online MSMEs. According to the survey in 2020 conducted by the Indonesian National Bureau of Statistics, the percentage of the Indonesian population with access to the internet is 53.73% [7] Meanwhile, the latest census in 2020 recorded that the total population in Indonesia was 270,203,917 people [8]. Therefore, the population frame to obtain the sample is 145,180,565 people. The survey used a simple random sampling technique that gives every individual an equal chance of being selected in a population sample [1]. Using Yamane's formula, the targeted survey sample was 156 respondents.

The interview respondent's requirement was the same as the survey. According to [11] considering the time constraint and the limitations, the interview was conducted with five respondents.

D. Analysis

The survey was analysed by SPSS software. Descriptive statistics were used to explain the general findings of the research combined with Spearman Rank Correlation to test the statistical significance between variables.

The interview was analysed based on the thematic analysis method that focuses on finding themes or patterns observed in the interview [33]. The transcribed interviews were then coded using NVivo software and explained in detail using a matrix.

E. Validity and Reliability

The survey validity test was conducted using Pearson Product-Moment Correlation. The total respondent was 261, and the r-value from the table with 5% significance is 0.121. The correlation coefficient was tested using SPSS to 10 Likert-scale questions, as seen in the table below:

Table 4 - PEARSON CORRELATION VALIDITY

**Correlation is significant at the 0.01 level (2-tailed)

Questions	Pearson Correlation	R-Value	Validity
Cybersecurity Term	0.751**	0.121	Valid
Hacking	0.777**	0.121	Valid
Identity Theft	0.792**	0.121	Valid
Phishing	0.821**	0.121	Valid
Virus	0.689**	0.121	Valid
Spyware	0.829**	0.121	Valid
Ransomware	0.819**	0.121	Valid
Denial of Service (DoS)	0.751**	0.121	Valid
DNS Tunnelling	0.702**	0.121	Valid
Cyberattack Victim	0.298**	0.121	Valid
Likeliness			

For all questions, the Pearson correlation coefficient was larger than the r-value. Therefore, all of the questions were valid.

The survey Reliability was tested using Cronbach's Alpha in SPSS, as shown in the table below:

Table 5 - CRONBACH'S RELIABILITY

Total Questions	Cronbach's Alpha	Reliability
10	0.904	Reliable

The Cronbach's Alpha result shows it is bigger than the most commonly accepted Cronbach's Alpha of 0.600 [14]. Therefore, the survey questions were reliable.

The interview method in this research was semi-structured to ensure every respondent was faced with the same questions. Respondents were chosen by their experience purchasing online clothing items from Indonesian MSMEs. In addition, the researcher tried to diversify the respondent by recruiting respondents with different education levels and occupations. The interview tone was also conducted professionally to ensure neutrality and reduce bias. As the objective of this research, the findings were applicable to generate recommendations to raise cybersecurity awareness in the Indonesian online clothing MSME environment.

F. Ethical Consideration

This dissertation project was conducted according to the University of Hull's ethical principles. The researcher signed an ethics form that the Supervisor approved. During the data collection, research participants were also informed about their voluntary rights to withdraw from the research at any time, and their personal information will not be revealed in any way.

G. Limitations

Because this research is assessing a specific sector of MSME in Indonesia and there were very limited resources available, this research mostly relied on academic resources in another country. Therefore, some of the most applicable resources were researched that targeted the Asia-Pacific region.

The research was entirely conducted in English, with the respondents requiring the research to be completed in Indonesian. As a result, several terms gained from English resources must be translated to Indonesian with the researcher's limited ability. In addition, some terms related to cybersecurity awareness have not yet had an equivalent translation in Indonesian.

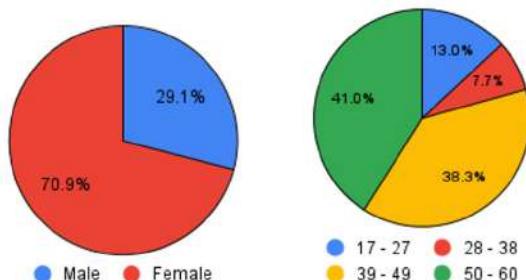
Reaching a large number of survey respondents is also another challenge. The survey result was biased because the sample demographic proportion did not represent the actual demographic of Indonesia.

There is also an ethical limitation where the researcher cannot collect the respondent's contact. Collecting the respondent's contact would have been beneficial in inviting the respondent for an interview to explore the topic further.

III. RESULTS

A. Survey

Two hundred sixty-one respondents were obtained using the Google Form platform. The survey used multiple choices and a 4-point Likert scale that was analysed using descriptive statistics and Spearman Rank Correlation Coefficient using SPSS.



Females dominated the survey respondents by 71%, with a total of 185 respondents. On the other hand, male respondents were 29%, with a total of 76 respondents. Meanwhile, respondents with the age range of 50-60 and 39-49 shared the biggest proportion, with a total of 107 (41%) and 100 (38%) respondents, respectively. This was followed by the age range of 17-27 with 34 (13%) respondents and 28-38 with 20 (8%) respondents.

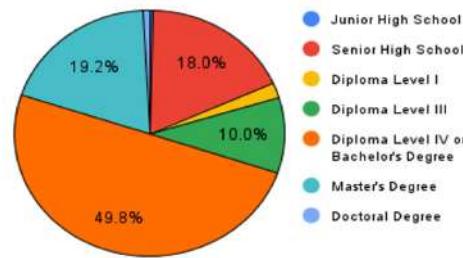


Fig. 2 Education Level

The respondents dominated the survey with higher education levels, with 130 (49.8%) completing Diploma Level IV or a Bachelor's degree and 50 (19.2%) completing a Master's degree. In addition, two respondents have a doctoral degree. Meanwhile, 26 (10%) respondents had a Diploma level III. Furthermore, 47 (18%) respondents completed Senior High School level.

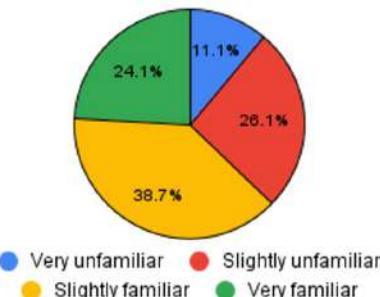


Fig. 3 Familiarity With "Cybersecurity" Term

The survey asked how familiar the respondents were with the term "cybersecurity", and 101 (38.7%) of respondents were slightly familiar with the term. There was a similar proportion of respondents who felt very familiar with the respondents who felt slightly unfamiliar, with 63 (24.14%) and 68 (26.05%) respectively. On the other hand, 29 (11.11%) respondents felt very unfamiliar with the term.

The respondents were also asked how familiar are they with eight types of cyberattacks using a 4-level Likert scale, and the result is shown in the table below:

Table 6 - TYPES OF CYBERATTACK FAMILIARITY

Types of Cyberattack	Average Answer	Familiarity
Hacking	2.88	Slightly familiar
Identity Theft	2.78	Slightly familiar
Phishing	2.37	Slightly unfamiliar
Virus	3.1	Slightly familiar
Spyware	2.38	Slightly unfamiliar
Ransomware	1.99	Slightly unfamiliar
Denial of Service (DoS)	1.95	Slightly unfamiliar
DNS Tunnelling	1.7	Slightly unfamiliar

As seen in the table above, most respondents were slightly familiar with Hacking, Identity theft, and Virus. At the same time, the respondents are slightly unfamiliar with the other five types of cyberattacks. The virus had the highest familiarity among the respondent, while DNS Tunnelling had the lowest.

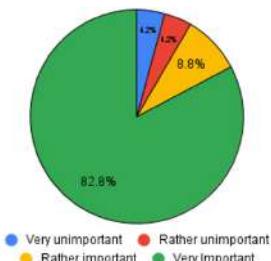


Fig. 4 The Importance of Keeping Personal Information Safe

Almost all respondents believe keeping their personal information safe while conducting an online transaction is essential. However, 23 (8.81%) respondents felt it was just rather important. Furthermore, there was an equal number of 11 (4.2%) respondents who believed that it was rather unimportant and very unimportant.

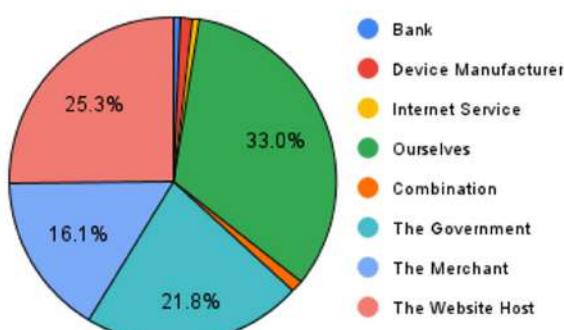


Fig. 5 Cybersecurity Responsibility

According to the respondents, the four largest parties responsible for cybersecurity are ourselves (33%) the website host (25.3%) the government (21.8%) and the merchant (16.1%). The realisation that cybersecurity is our own responsibility had the highest response of 86 respondents.

A correlation test was conducted using Spearman Rank Correlation Coefficient to five variables to analyse the survey findings.

Table 7 - CYBERSECURITY TERM FAMILIARITY CORRELATION

** Correlation is significant at the 0.01 level (2-tailed)

“Cybersecurity Term Familiarity”			
	Correlation Coefficient	Sig. (2-tailed)	N
Types of Cyberattack	.668**	0.000	261
Cybersecurity Importance	.181**	0.003	261
Cyberattack Experience	.169**	0.006	261
Cybersecurity Measures	0.003	0.964	261

The table shows a correlation between respondents' familiarity with the term "cybersecurity" with the types of cyberattack, cybersecurity importance and cyberattack experience. However, there is no correlation with cybersecurity measures taken by the respondents.

Table 8 - EDUCATION LEVEL CORRELATION

** Correlation is significant at the 0.01 level (2-tailed)

“Education Level”			
	Correlation Coefficient	Sig. (2-tailed)	N
“Cybersecurity” Familiarity	0.082	0.185	261
Types of Cyberattack	.161**	0.009	261
Cybersecurity Importance	0.007	0.913	261
Cybersecurity Responsible	0.069	0.266	261
Cyberattack Experience	0.071	0.250	261
Cybersecurity Measures	0.051	0.408	261

The table shows a correlation between respondents' familiarity with the term "cybersecurity" with the types of cyberattack, cybersecurity importance and cyberattack experience. However, there is no correlation with cybersecurity measures taken by the respondents.

Table 9 - PURCHASING FREQUENCY CORRELATION

** Correlation is significant at the 0.01 level (2-tailed)

“Purchasing Frequency”			
	Correlation Coefficient	Sig. (2-tailed)	N
“Cybersecurity” Familiarity	.136*	0.028	261
Types of Cyberattack	.142*	0.021	261
Cybersecurity Importance	0.093	0.136	261
Cybersecurity Responsible	0.080	0.198	261
Cyberattack Experience	0.090	0.147	261
Cybersecurity Measures	0.052	0.403	261

The table shows that respondents' purchasing frequency only correlated to familiarity with the term "cybersecurity" and different types of cyberattacks. There was no correlation with the other four cybersecurity aspects.

Customer's Cybersecurity Awareness in Indonesian Online Clothing Micro, Small and Medium Enterprises

Table 10 - LIKELINESS CORRELATION

“Likeliness to be a Cyberattack Victim”			
	Correlation Coefficient	Sig. (2-tailed)	N
Cyberattack Experience	0.056	0.368	261
Cybersecurity Measures	-0.009	0.888	261

The result shows no correlation between the respondent's likelihood of being a cyberattack victim with cyberattack experience and cybersecurity measures they have taken.

Table 11 - CYBERSECURITY IMPORTANCE CORRELATION

“Cybersecurity Importance”			
	Correlation Coefficient	Sig. (2-tailed)	N
Cybersecurity Responsibility	-0.016	0.794	261
Cyberattack Experience	0.037	0.556	261
Cybersecurity Measures	-0.019	0.763	261

The table shows no correlation between respondents' understanding of cybersecurity importance with cybersecurity responsibility, cyberattack experience, and cybersecurity measures.

B. Interview

The semi-structured interview was conducted with five respondents with various occupations (see table 12 below) using the Google Meets platform. The transcribed interview result was then analysed using NVivo software. The analysis will discuss the respondent's cybersecurity awareness, cybersecurity measures taken by the respondents and respondent's opinions on raising cybersecurity awareness in the Indonesian online clothing MSME environment.

Table 12 - INTERVIEW RESPONDENT PROFILE

Respondent's Name	Completed Education Level	Occupation
Respondent A	Senior High School	Student
Respondent B	Bachelor's Degree	Diver
Respondent C	Bachelor's Degree	UI/UX Designer
Respondent D	Senior High School	F&B Entrepreneur
Respondent E	Diploma Level III	Occupational Therapist

All respondents were asked how familiar they are with the term "cybersecurity" and to elaborate on their understanding of it. The most mentioned word from the respondents was data, purchase and risk. The respondent's response is shown in the table below:

Table 13 - CYBERSECURITY AWARENESS ELABORATION

	Data	Responses	Risk
		Purchase	
Res. A		“... whether it's about purchase...”	“... digital world, the risk will be higher..”
Res. B	“... it's about keeping our data safe”		
Res. C	“... how we protect our data...”		“... avoid the risk of breach...”
Res. D	“... submitting personal data...”	“... when conducting an online transaction...”	
Res. E	“I think it's personal data security...”	“... when we shop online”	“... I understand several risks...”

Most respondents defined cybersecurity as protecting personal data while conducting an online transaction or purchase. However, as [22] argues, cybersecurity is about protecting and defending against cyberattack risks. Two respondents included risk as part of their understanding. Along with the themes mentioned above, two respondents defined cybersecurity in the context of cyberspace and social media.

Respondents were also asked how familiar they were with eight types of cyberattacks. Their response is shown in the table below:

Table 14 - CYBERATTACK FAMILIARITY

		Responses				
		Res. A	Res. B	Res. C	Res. D	Res. E
Hacking	Familia r	Familia r	Familia r	Familia r	Familia r	Familia r
Identity Theft	Familia r	Familia r	Familia r	Familia r	Familia r	Familia r
Virus	Familia r	Familia r	Familia r	Familia r	Familia r	Familia r
Phishing	Familia r	Familia r	Familia r	Familia r	Unfamili ar	Unfamili ar
Spyware	Familia r	Familia r	Familia r	Unfamili ar	Unfamili ar	Unfamili ar
Ransomware	Familia r	Familia r	Familia r	Unfamili ar	Unfamili ar	Unfamili ar
Denial of Service	Unfamili ar	Familia r	Familia r	Unfamili ar	Unfamili ar	Unfamili ar
DNS Tunnelling	Unfamili ar	Unfamili ar	Familia r	Unfamili ar	Unfamili ar	Unfamili ar

All interview respondents were familiar with Hacking, Identity Theft and Virus. On the other hand, DNS Tunnelling is the most unfamiliar type of cyberattack, according to the respondents.

Respondents were asked how they ensure their cybersecurity when purchasing an online clothing item from MSME in Indonesia. The most recurring theme was respondents using a third party to increase their security. There were also other measures taken by the respondents shown in the table below:

Table 15 - ENSURING CYBERSECURITY

	Res. A	Res. B	Res. C	Res. D	Res. E
3 rd Party Security		“... third party will take part in the transaction ...”	“... third party such as e-commerce ...”	“... used e-commerce platform as a third party”	“... indicate on that the website is active with many customers ...”
Be Generally Careful			“... very careful uploading my phone number and address ...”	“... avoid using full name, only first name ...”	“... look for testimony from previous customers ...”
Only Trusted Brands	“... I look for brands that guarantees the security ...”	“... purchase from trusted website s ...”		“... Reputation ...”	“... I would be looking at the review ...”
Reviews	“... positive ly reviewed by the public ...”	“... feedback and reviews from the other customers ...”		“... Multiple contacts ...”	“... I choose the brand with the highest reputation ...”

Three respondents saw the third party as an additional layer of security that can be trusted. For example, respondent B refers to the third party as the payment gateway, while respondents D and E use e-commerce platforms as the transaction intermediary. Furthermore, respondents D and E also being cautious regarding their names, phone numbers and home address. Another theme is brand trust, where respondents choose the brand based on their reviews and feedback from other customers.

The interview also explored what kind of features or signs that in their opinion, makes MSME brands or websites

safe for the transaction. Their responses will be shown in the table below:

Table 16 - CONSIDERATION OF CHOOSING MERCHANTS

			Responses	Res. A	Res. B	Res. C	Res. D	Res. E
		Online store display	“... indicate on that the website is active with many customers ...”		“... present able website ”	“... developed, active, and maintained”	“... website that are developed, active, and maintained”	“... great display of the website ...”
		Review or testimony	“... look for testimony from previous customers ...”	“... I would be looking at the review ...”		“... I choose the brand with the highest reputation ...”		“... the number of reviews ...”
		Reputation	“... Reputation ...”	“... data leak, bad reputation or other news ...”	“... I trust merchants that provide s contact s and have an offline store”			
		Multiple contacts	“... Multiple contacts ...”					“... many different forms of communication ...”

The interview result shows that visually pleasing MSME's online store is one sign that makes respondents trust them. Respondents then look into the merchant's review or testimony and seek the merchant's reputation. Furthermore, providing multiple forms of communication shows the merchant can be reached by the customers and are safe.

The interview asked respondents where their primary source of learning about cybersecurity is. The researcher also asked the respondents what they thought was the most interesting and the easiest way to learn about cybersecurity. Finally, the respondents were offered to recommend how to raise cybersecurity awareness in the Indonesian online clothing environment. The respondent's response can be seen in the three tables below:

Customer's Cybersecurity Awareness in Indonesian Online Clothing Micro, Small and Medium Enterprises

Table 17 - SOURCE OF LEARNING

	Responses				
	Res. A	Res. B	Res. C	Res. D	Res. E
Academics	“... I'm currently taking a cybersecurity course in my University ...” “... try to protect myself and learn some...”	“... I studied about it in Univers	“... one of my course in my comput	“... ask a friend or family about cybersecurity ...”	“... smalls t environ ment, which is family ...”
Self-Taught	“... try to protect myself and learn some...”		“I have read several articles ...”		
Friends and family	“... talked about it with my fellow gaming friends ...”		“I have a friend that specialize in this aspect ...”		

The respondents had a variety of sources of learning. Most respondents learned about cybersecurity in a formal higher education such as University. Some others also taught themselves and read articles. There were also friends and family involved in learning about cybersecurity.

Table 18 - LEARNING ABOUT CYBERSECURITY

	Responses				
	Res. A	Res. B	Res. C	Res. D	Res. E
Academics	“... we can also learn from scholar researches ...”	“... you can take courses in any educational institutions ...”	“... articles would be a great source to learn about cybersecurity ...”		
Social Media	“... many educational account in social media that talks about cybersecurity ...”	“... plenty of sources are available in Google or YouTube ...”	“... though social media such as TikTok and Instagram ...”		

		Responses				
		Res. A	Res. B	Res. C	Res. D	Res. E
	Friends and family	“... ask a friend or family about cybersecurity ...”	“... smalls t environ ment, which is family ...”			

Respondents believed that the best way to learn about cybersecurity is through the academic environment and social media. On the other hand, some respondents still believed that learning from friends or families is one of the best ways to learn about cybersecurity..

Table 19 - RESPONDENT'S RECOMMENDATION

		Responses				
		Res. A	Res. B	Res. C	Res. D	Res. E
	Education Sector	“... introduce cybersecurity in formal education such as schools ...”				“... should be included in school curriculum ...”
	Merchant Participation		“... business owners should invest in hiring experts ...”			
	Government Training				“... the government provide training programs for MSME owners ...”	

Furthermore, respondents were also asked how we can make cybersecurity learning interesting. However, there is no general theme that appeared. In contrast, every respondent provided different ways, such as movies and videos, Instagram filters, songs and slogans, games, community participation, joining a hackathon competition, and even waiting until they experienced a cyberattack themselves.

IV. DISCUSSION

This research aimed to assess Indonesian online clothing MSME customers' cybersecurity awareness and provide recommendations on raising cybersecurity awareness in the Indonesian online clothing MSME environment. The survey showed a different level of awareness for each aspect of cybersecurity. The interview further explored the respondent's understanding of cybersecurity and provided recommendations to raise cybersecurity awareness.

A. Customer's Cybersecurity Awareness

The survey result shows that 24.14% of the respondents were very familiar with the term "cybersecurity". Most respondents felt slightly familiar with the term sharing, 38.7% of the total respondents. The correlation test (see table 7) shows that the respondent's awareness is not limited to cybersecurity as a term, but also respondents are aware of the given types of cyberattack. The correlation also shows the more people familiar with the term "cybersecurity", the more important it is for the respondents to keep their personal information while conducting an online transaction. Moreover, the correlation also indicates the significance between the term familiarity and cyberattack experience. This might imply that experiencing a cyberattack contributes to respondents' cybersecurity awareness. The interview (see table 13) reveals that respondents can associate cybersecurity with risk, which is one aspect of cybersecurity in line with the literature review. Other than risk, respondents also associate cybersecurity with personal data and online transactions.

The following correlation test (see table 8) was between respondents' education level and other cybersecurity aspects. However, the test only shows the correlation significance between education level and types of cyberattacks. This implies that the higher the education level of the respondents, the more familiarity they have with different types of cyberattacks. The interview (see table 17) confirms this by showing three respondents' sources of learning about cybersecurity through formal educational institutions such as universities. This correlation test shows education level is a significant factor in customers' cybersecurity awareness.

Another correlation test (see table 9) was between purchasing frequency and other cybersecurity aspects. The higher the respondent's purchasing frequency, the higher their familiarity with different types of cyberattacks. The two significant correlations show that customers are aware of cybersecurity when purchasing a clothing items from online MSMEs in Indonesia. Customers are not only aware of cybersecurity as a term but also of the different

types of cyberattacks. The interview (see tables 15 and 16) shows that respondents took several measures when selecting merchants. Three out of five respondents prefer a third party as an intermediary to ensure their transaction safety. Respondents were also careful about revealing their private information, limiting their transactions to trusted brands and checking the merchant's review. When selecting the merchant, the merchant's online store contributes significantly towards the respondent's trust along with the review or testimony, merchant's reputation and merchants that provide multiple forms of communication with the customers.

The correlation test of likeliness of being a cyberattack victim with cyberattack experience and cybersecurity measures shows no significant correlation. Customers' judgement on how likely they are to be cyberattacked has nothing to do with their cyberattack experience and the cybersecurity measures they have taken. The correlation test of customers' understanding of cybersecurity importance also shows no significance with cybersecurity responsibility, cyberattack experience and cybersecurity measures.

B. Recommendation to Raise Cybersecurity Awareness

This research shows the variety level of awareness among Indonesian online clothing MSME customers. The correlation test shows that education cybersecurity awareness correlates significantly to educational level. In general, making education accessible will also improve overall cybersecurity awareness in the Indonesian MSME environment. The interview respondent also recommends including a cybersecurity awareness program in the school curriculum.

Respondent A	"Maybe put some "spices" in formal education such as schools."
Respondent B	"think cybersecurity awareness should be included in the school curriculum as well."

Many respondents still believe that cybersecurity is another party's responsibility, such as the government, the website host and the merchant. However, people still do not realise that the most responsible party in cybersecurity is ourselves. While people expect the government, the website host and the merchant to be responsible for people's cybersecurity, it also provides an opportunity to address the misunderstandings among the people. As mentioned earlier, the government can include a cybersecurity awareness program in schools, starting a highly engaging campaign and providing training to those already involved in the MSME environment.

MSME owners can also participate by promoting their business through a secured website. The interview results

show that displaying a merchant's online store contributes to customer trust. Having a secured website might be a significant investment at first but will improve the MSME environment overall.

As individuals, we can raise our cybersecurity awareness by following educational accounts on social media, participating in a community, or reading trusted academic articles.

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

This research aimed to assess the cybersecurity awareness of Indonesian online clothing MSME customers and to provide recommendations on raising cybersecurity awareness in the Indonesian online clothing MSME environment.

Based on this research's quantitative method of survey and qualitative method of interviews, we can conclude that most online clothing MSME customers in Indonesia are aware of cybersecurity and cyberattack risks. It is then supported by the strong correlation between the cybersecurity familiarity with types of cyberattack, customers' understanding of cybersecurity importance and cyberattack experience, which shows that customers understand beyond the term.

Education was an important factor that contributed to customers' cybersecurity awareness. A correlation was found between survey respondents' education level with the familiarity with several types of cyberattacks. The correlation is further supported by the interview where three respondents gain cybersecurity awareness through the academic environment. Interview respondents also believe that the academic environment is the best source of learning about cybersecurity.

Customer's awareness is also shown by the correlation between customers' shopping frequency, familiarity with cybersecurity terms and types of cyberattacks. The correlation indicates that customers are aware of the increasing cybersecurity risk parallel to the online shopping frequency. This correlation is also further supported by various cybersecurity implementations by interview respondents. Interview respondents' methods of minimising cybersecurity risks are mostly using 3rd party as a transaction intermediary, choosing reputable brands and relying on the brand's review or testimony.

Referring to the importance of this research, cybersecurity awareness from a customer's perspective was assessed. Hopefully, this research can raise cybersecurity awareness

that is mostly overlooked in Indonesia, especially in Micro, Small and Medium enterprises environments. This research could be the foundation of Indonesian MSME customers' cybersecurity awareness and provide insights for further research in different MSME sectors.

B. Recommendation

Based on this research, there are various opportunities for all parties to be involved to raise cybersecurity awareness. All parties should take part in educating people that cybersecurity is our own responsibility.

The government could take part by focusing on policies in the education sector such as adding cybersecurity courses at multiple education levels. The government cyber and crypto agency could also start a cybersecurity educational campaign through various social media to reach people across different levels. Another method to be considered is adding cybersecurity to training that is provided to MSMEs.

For the MSME owners, building a customer's trust is beneficial for the business, and one of the methods is by having a well-displayed and secured website. It might be an expensive investment, in the beginning, to implement security features on the website, but will pay off in the future. When customer trust is built, MSME can promote and educate cybersecurity its customers.

Future research could address different sectors of Indonesian MSME to address the awareness level of both the merchant and the customers. It will also be beneficial for further studies to explore cybersecurity awareness in Indonesian online shoppers to provide better insights for the policymakers. Further research is needed to determine how effective each method of raising cybersecurity awareness in this research for a government policy to be implemented.

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Paper 64

Market Evaluation of Changes in Size and Ingredient of Roti Pisang Production

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ICMEM

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Abstract - The pandemic that occurred in 2020 had an impact on the growth of the food and beverage industry managed by SMEs in Indonesia. However, in 2021 there has been a 5% increase in the food and beverage industry. One of them is the bakery business which has increased sales of bread to reach Rp. 18.7 billion. The high demand makes the competition in the bakery business increasingly tight, so UKM Bakery E tries to make various innovations to develop its business but finds some problems in developing it. This happened after a decline in sales of the "Roti Pisang" product so the researchers help by interviewing the owner to find the main problem using root cause analysis and the main problem is product quality instability. Then use the experiment method by changing the size and the ingredient in the production process. The sample that has been made is tested on market with a questionnaire and the result shows that changing the size can help improve the quality of "Roti Pisang" so it can help increase the sales of Bakery E.

Keywords - Quality Product, Size, Ingredient, SME

I. INTRODUCTION

Since the pandemic occurred in 2020, many SMEs in Indonesia have suffered losses and not many have gone bankrupt. However, in 2021 the food and beverage industry will grow 2.54% to Rp775.1 trillion when measured by GRDP at constant prices (ADHK) 2010. This makes for a 1.58% increase in the food and beverage industry. This increase can be seen in Figure 1.

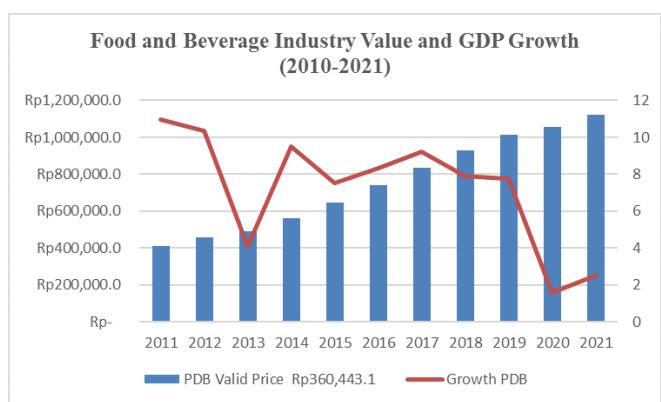


Fig. 1. Food and Beverage Industry Value and GDP Growth (2010-2021)

This increase occurs because the demand for food and beverages is high because people still need to consume nutritious food to increase their immunity to maintain health. In addition to increasing immunity, food is one of the basic needs for human life, so the need for food increases. When the demand for food increases, the food and beverage industry will also increase. One of the food and beverage industries that has experienced an increase is the bakery business which has succeeded in increasing sales of bread to reach USD 18.7 billion (Rp 2.6 trillion) in Indonesia in 2021. The following is an increase in bread consumption in Indonesia as shown in table 1.

Table 1 - THE AVERAGE CONSUMPTION OF FOOD AND BEVERAGES PER CAPITA IN 2016 – 2020

Food Items	Units	Year					Growth Average 2016-2020 (%)
		2016	2017	2018	2019	2020	
Ordinary Bread	Small Pack	-	19.132	19.085	18.693	17.733	-
Other Bread	0.1 Kg	-	57.578	58.498	60.272	58.869	-
Cookies	0.1 Kg	19.449	20.017	22.824	23.095	22.834	4.250%
Boil or Steam Cake	Unit	67.264	70.112	74.626	78.838	77.160	3.547%
Fried Food	Piece	59.036	178.807	181.510	178.203	169.821	1.855%
Porridge of Mungbean	Portion	-	5.802	6.313	6.776	6.625	-
Kind of Salad With Peanuts Sauce	Portion	10.220	11.177	11.078	10.811	10.189	0.080%
A Place of Rice Accompanied by a Mixture Peanuts Sauce	Portion	38.899	42.938	43.273	42.173	40.740	1.306%
Fried Rice	Portion	8.499	9.913	10.256	10.369	9.838	4.019%
Rice	Portion	8.551	11.149	12.743	14.890	15.008	15.579%
Rice Steamed in a Banana Leaf or Coconut Leaf	Portion	12.045	10.708	10.895	11.211	10.535	-3.121%
Soup	Portion	8.030	8.364	9.087	9.340	8.944	2.837%
Roasted Meat on Skewer	Portion	-	4.482	4.910	5.133	4.967	-
Noodle (with Meatball/Boiled/Fried)	Portion	29.774	30.679	31.433	30.963	29.594	-0.104%
Instan Noodle	Portion	-	4.576	4.701	4.722	4.287	-
Snack for Children	0.1 Kg	39.524	38.606	39.316	37.058	35.967	-2.293%
Fish (Fried, Roasted, etc)	Piece	6.935	7.352	8.096	8.480	8.712	5.902%
Chicken/Meat (Fried, Roasted,etc)	Piece	9.855	9.923	11.281	12.736	13.213	7.755%
Other Prepared Food	Piece	-	18.010	23.563	25.411	24.270	-

The increase in sales of bread makes the competition between bread businesses increasingly tight so that bakers compete with each other to maintain and improve the quality of their products to attract consumer interest. A company must be able to create products with quality in accordance with market desires so that consumers can be satisfied where customer satisfaction can provide benefits for the company. As the Wilujeng et.al. (2021) stated that the conditions in bread manufacturing have been significantly affected by good quality control of the

product [1]. The paper shown that good quality control makes sales increase from period to period.

Quality improvement can be done with innovation in bakery products in the form of improving the quality of ingredients to improve the taste of the product, changing or adding color variations to attract the attention of the eye, and changing the size or shape to attract consumers interest, attention, and so on. In addition to satisfying consumers, improving product quality can also help develop businesses so that they can continue to survive and compete in the market. As has been done by SME Bakery E, Bakery E is an SME located in the Blora district and the reason for seeing Bakery E is because of the researchers' interest in the problem. Bakery E has made various innovations in improving the quality of its bakery products. However, in developing its business, Bakery E made various innovations to develop its business but found several obstacles in developing it. This happened after a decline in sales of one Bakery E product, namely Banana Bread, the researcher would help by interviewing the owner to find out the main problem which then helped solve it in order to increase sales of Banana Bread products at Bakery E.

One of the main reasons is that the raw ingredient scarcity, production equipment does not work optimally, company finances are not recorded properly, working hours and job desk are unclear, product quality is unstable, and service is not satisfactory to consumers. The problem shown in Figure 2.

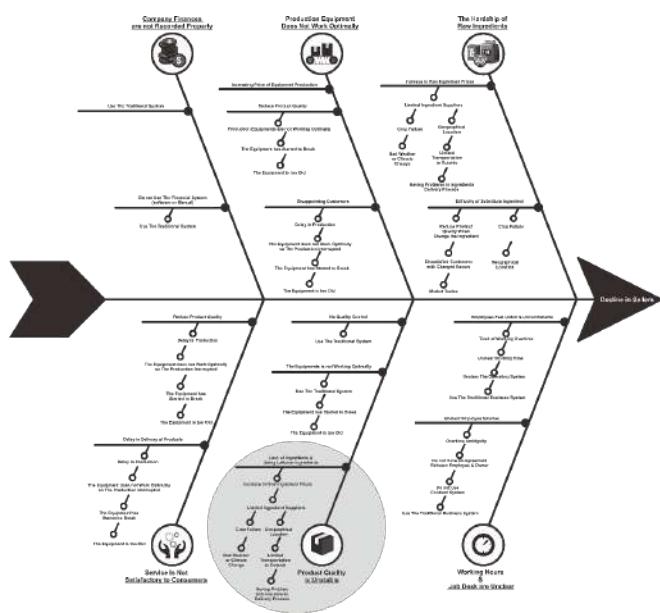


Fig. 2. Root Cause Analysis of Bakery E

II. METHODOLOGY

The methodology used by this research is by looking at the root cause analysis (RCA) with fishbone and 5 Whys and the experiment. The root cause of a problem is a process that underlies a variety of work to find the root of the problem by identifying something (Mars, 2020) [2]. The Fishbone diagram method is a root cause analysis technique that can show several causes of an event or certain events that are shaped like a fish skeleton. This technique can be used to analyze cause and effect in order to identify complex relationships between cause and effect on a particular problem or event. The use of this technique is to create fishbone diagrams that identify problems or impacts, categories of root causes, seek suggestions for possible causes, identify categories of causes, seek consensus and confirm the results of the application analysis. (Susendi, Adrian, Sopyan, 2021) [3]. Then, 5 Why Analysis is a technique of root cause analysis used to investigate problems and causes of deviations that occur in the production environment. This method has the basic principle of explaining the situation, asking why the event happened, and then changing the answer from the first answer to the second question. The process is repeated until the root cause of the event is determined. The purpose of repeating the questions is to find the relationship between cause and effect that underlies the serious problems that arise (Susendi, Adrian, Sopyan, 2021) [3].

The experimental method is a method that can affect certain variables so that it can test the hypothesis of a causal relationship when used correctly (Fraenkel, Wallen, & Hyun, 2012) [4]. The experiment itself consisted of finances that were not recorded properly, equipment that did not work optimally, scarcity of raw materials, unsatisfactory service to customers, unstable quality control, and unclear working hours and job descriptions. This research focuses on solving the problem of unstable product quality. Problem-solving for unstable product quality due to the results of RCA analysis. In addition, solving these problems can also help solve the problem that the service is not satisfactory to consumers and the hardship of raw ingredients so that it can increase sales at Bakery E.

Improving product quality can increase customer satisfaction with a product, so improving product quality requires constant attention and commitment from every individual in the company. One of the factors that can affect product quality is raw materials. Raw materials are components that can affect the quality of products produced by the company, so raw materials are very important. Therefore, controlling the quality of raw materials is a very important factor so a company needs to pay attention to the selection and storage of raw

materials to minimize the possibility of using lower-quality raw materials in the production process. The choice to focus on improving product quality in raw materials was due to the results of interviews, RCA analysis, and the business situation of Bakery E (Kamaludin, & Sulistiono, 2013) [5].

Then the experiment itself was carried out by conducting interviews with customers as primary data. The interviewees were asked about bread preferences, problems they face, and also products they would like more attention to. When interviews provided solid evidence that the issues were aligned, the next experiment was carried out by making three different types of bread; add more eggs, reduce the size, and both. The experimental variables were given to the interviewees and then they filled out the experimental assessment form.

III. RESULTS

From 49 respondents, that the number are set because it representing the pool sample of Blora residents of 93.779, it was found that 51% are men and 49% are women, 55% are aged between 31-45 years old, 39% of them are students, and 49% have an income between IDR 1.000.000 to IDR 1.500.000. As for the bread itself 76% choose roti pisang (banana bread), 41% choose roti keju (cheese bread), and 47% choose roti ayam (chicken meat bread).

Table 2 - THE RESPONDENT RESPONDS ABOUT TASTE ACCORDING TO EXPERIMENT VARIABLES

Respondent	Taste A	Taste B	Taste C
Value Percentage 5	84%	24%	39%
Value Percentage 4	12%	39%	20%
Value Percentage 3	4%	33%	33%
Value Percentage 2	0%	4%	8%
Value Percentage 1	0%	0%	0%

Table 2 showed about taste experiment that the Bread A (resize the product) counts in 82% as the most preferable, whereas the Bread B (adds the egg) counts in 39% as the quite preferable and Bread C (both resizes and adds the eggs) counts in 39% as the most preferable.

Table 3 - THE RESPONDENT RESPONDS ABOUT TEXTURE ACCORDING TO EXPERIMENT VARIABLES

Respondent	Texture A	Texture B	Texture C
Value Percentage 5	59%	22%	14%
Value Percentage 4	29%	37%	31%
Value Percentage 3	12%	39%	41%
Value Percentage 2	0%	2%	14%
Value Percentage 1	0%	0%	0%

Table 3 showed about texture experiment that the Bread A (resize the product) counts in 59% as the most preferable, whereas the Bread B (adds the egg) counts in 39% as the preferable and Bread C (both resizes and adds the eggs) counts in 39% as preferable.

Table 4 - THE RESPONDENT RESPONDS ABOUT AROMA ACCORDING TO EXPERIMENT VARIABLES

Respondent	Aroma A	Aroma B	Aroma C
Value Percentage 5	55%	12%	27%
Value Percentage 4	31%	45%	20%
Value Percentage 3	14%	37%	45%
Value Percentage 2	0%	6%	8%
Value Percentage 1	0%	0%	0%

Table 4 showed about aroma experiment that the Bread A (resize the product) counts in 55% as the most preferable, whereas the Bread B (adds the egg) counts in 45% as the quite preferable and Bread C (both resizes and adds the eggs) counts in 45% as the preferable.

Table 5 - THE RESPONDENT RESPONDS ABOUT APPEARANCE ACCORDING TO EXPERIMENT VARIABLES

Respondent	Appearance A	Appearance B	Appearance C
Value Percentage 5	69%	43%	57%
Value Percentage 4	12%	27%	6%
Value Percentage 3	14%	22%	37%
Value Percentage 2	4%	6%	0%
Value Percentage 1	0%	2%	0%

Table 5 showed about appearance experiment that the Bread A (resize the product) counts in 69% as the most preferable, whereas the Bread B (adds the egg) counts in 43% as the most preferable and Bread C (both resizes and adds the eggs) counts in 57% as the most preferable.

Table 6 - THE RESPONDENT RESPONDS ABOUT SATISFACTORY ACCORDING TO EXPERIMENT VARIABLES

Respondent	Satisfied A	Satisfied B	Satisfied C
Value Percentage 5	84%	6%	24%
Value Percentage 4	14%	61%	31%
Value Percentage 3	2%	29%	35%
Value Percentage 2	0%	2%	10%
Value Percentage 1	0%	2%	0%

Table 6 showed about satisfactory experiment that the Bread A (resize the product) counts in 84% as the most preferable, whereas the Bread B (adds the egg) counts in 61% as the quite preferable and Bread C (both resizes and adds the eggs) counts in 35% as the preferable.

Table 7 - THE RESPONDENT RESPONDS ABOUT PRICE ACCORDING TO EXPERIMENT VARIABLES

Respondent	Price A	Price B	Price C
Value Percentage 5	2%	2%	2%
Value Percentage 4	20%	10%	8%
Value Percentage 3	10%	12%	12%
Value Percentage 2	14%	4%	2%
Value Percentage 1	53%	71%	76%

Table 7 showed about price experiment that the Bread A (resize the product) counts in 53% as the most unpreferable, whereas the Bread B (adds the egg) counts in 71% as the most unpreferable and Bread C (both resizes and adds the eggs) counts in 76% as the most unpreferable.

V. CONCLUSION

In this study, researchers found the results of their research using a market evaluation at Bakery E. The results of this study were a positive response from the Bakery E-market to the sample of bread A. Sample of bread A was an experimental product that had a variable change in the size of the bread.

As research conducted above, Bakery E clearly needs to resize its products as the data shown above prove that the product with changing in size compared to the respondent result are mostly positive except for the price. The preferences about sample of Bread A (resize the product) are positive in taste (82%) texture (59%) aroma (55%) appearance (69%) and satisfactory (84%).

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Paper 65

Business Model Innovation : A Case Study Nitya

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Abstract - A scarcity of grass in Jabodetabek area makes cattle fattening process become costly and more time-consuming. This makes farmers need to find alternative source of food to make fattening process still affordable. This is where Nitya Feed, a cattle feed from seaweed produced by Nitya company, comes as a solution for farmers. However, Nitya still does not have a solid business model yet. The purpose of this study is to find the most suitable business model for Nitya. Initially, Nitya has designed a business model in the form of membership and packaged-food sales. This study uses a qualitative method by conducting semi-structured interview on ten cattle farmers. The interview was conducted by comparing Nitya's designed business model with farmer's behaviors and their willingness to pay. The interview's results show that Nitya's business model is in accordance with the farmer's behavior. Therefore, membership and packaged-food sales are the most suitable way to transfer Nitya's value to cattle farmers.

Keywords – Cattle feed, Business model, Customer behavior, Willingness to pay, Nitya

I. INTRODUCTION

Beef is one of the main sources of public consumption, especially in Indonesia. Not only high in protein, vitamins, and minerals, there are many benefits that can be obtained from consuming beef for health. Some of the benefits that can be obtained from consuming beef are it helps the body produce haemoglobin, supports the immune system, and improves muscle health [1].

Although it has many benefits, unfortunately Indonesian people have not been able to fully enjoy the benefits of meat. This is because the meat consumption of the Indonesian people as of 2021 is still at 38 grams/month [2] while we are recommended to consume beef at least 1.4 kg/month [3]. Unfortunately, the level of beef consumption has not been met from year to year.

Beef production cannot be separated from the cattle fattening process. Nowadays, the fattening process takes a long time and costs a lot of money. This is based on our interviews with several cattle farmers in Jabodetabek. This happens because farmers no longer use grass as the main feed during the process. Farmers no longer use grass because grass is getting harder and harder to get.

Therefore, some farmers decide to mow the grass in some areas or use other feeds as a substitute for grass such as straw. In addition, during the fattening process, cows also need to be given additional food such as concentrates and vitamins to maintain their quality. This is the reason why fattening is long and expensive. Therefore, it is necessary to make products that can help cattle farmers to improve their cattle fattening process and give them an affordable price.

Nitya is a cattle feed producing company. Nitya's product is cattle feed whose raw material is seaweed. Their products consist of forage, in the form of seaweed, as well as concentrates consisting of bran, cassava pile, and coffee grounds. The value that Nitya offers is animal feed which has a high nutritional content and has an affordable price. High nutritional content in feed can accelerate the duration of fattening cattle. Affordable prices can reduce the cost of farmers so that farmers can sell cattles with a larger margin.

The basic core logic and strategic decisions of a company are represented by its business models, which allow it to develop enticing value propositions for delivery to consumers and to benefit from cost and risk structures that can effectively capture the resulting value [4]. During Nitya's one-and-a-half-year run, we have made a high-fidelity prototype and tested it to two potential customers, and they were affirmative. We need to proceed to the next step which is selling in the mainstream market. Unfortunately, we still do not have a solid business model. We have an initial business model, which is membership, but we have not done any feasibility test with the business model. Therefore, it is important for the writer to research "Business Model Innovation: A Case Study of Nitya." to find out whether membership is the best business model for Nitya or not.

There are three theories that supports this research. First theory is willingness to pay. Willingness to pay, sometimes abbreviated as WTP, is the maximum price a customer is willing to pay for a product or service [5]. Consumers evaluated the utility of each quality attribute before deciding to purchase [6]. Willingness to pay is influenced by several factors including price, age of the consumer, level of education, number of dependents in the respondent's household and historical consumption preference [7]. Reference [7] also said, the consumer

values the environmental services maintained or created by the product or its production, they may be willing to pay a price premium. The implementation of willingness to pay in this study is to find out the maximum price potential customers are willing to pay for our product and test whether they will buy our product with our current price.

Second is customer behavior. Consumer behavior refers to the process of organizing and obtaining information following a purchasing decision and of using and evaluating products and services [8]. Reference [8] also mentioned that This process also covers the selection, purchase, use, evaluation and disposal of products and services. In marketing and consumer behavior studies, product attributes act as qualifiers of products and determinants of product purchase during the consumer decision-making process, since these are the assessment criteria used by consumers to judge purchase alternatives [9]

Culture, social, personal, and psychological factors all influence customer buying behavior [10]. Reference [10] also said the values and norms of social life are not something that consumers are born with; rather, they must learn about what they are taught by their family and their surroundings. Social class has an impact on many purchasing behaviors. Personal characteristics include things like age and life cycle, occupation and economic situation, personality, way of life, and self-concept. Examples of psychology include perception, learning, faith, and motivation. Customers' perceptions are influenced by a variety of things. The variables are internal, external, self-concept, and lifestyle. External influences include things like preferences, memory, learning, motivation, personality, emotion, and behavior. Self-concept is a person's opinion of themselves.

The context of customer behavior in this study is to examine what is our potential customer's nature in using our product, in this case cattle farmers. Reference [11] defined customer behavior into several variables which are summarized into a full life cycle use case. This framework explains how their current product no longer fulfills their needs and must find other alternatives. Outlining the customer's present workflow is beneficial because doing so makes it simpler to integrate your solution into their business. Utilization of Full life cycle use cases is to make customers do word-of-mouth to other customers.

Third is business model innovation. There are several definitions of business model innovation. According to Aspara et al, business model innovation is efforts that aim to challenge current industry-specific business structures, responsibilities, and relationships in specific geographic market sectors in order to create new value [12]. Reference [13] stated that business model innovation

refers to an organization's pursuit for innovative business models and methods for creating and capturing value for its stakeholders. Business Model Innovation can range from minor adjustments to certain parts of business models, expansion of the current business model, the introduction of competing business models, all the way up to disruption of the business model, which may involve completely replacing the current model with a new one [14].

Value proposition, value creation, and value capture innovation are the three main components of the multi-dimensional construct known as business model innovation [15]. Innovation in a company's value proposition relates to its line-up of fresh goods and services for customers as well as to how it creates new customers, market segments, and customer relationships [16]. By utilizing its resources as well as intra- and inter-organizational process skills, a company can generate new values and raise the total value in the value network. This process is known as value creation innovation [17]. Innovation in a company's revenue model and/or cost structure to more effectively distribute and capture value in the value network is known as value capture innovation [18].

II. METHODOLOGY

Researcher uses a qualitative method in this study. An interpretive philosophy is frequently related with qualitative research. It is interpretative in nature because researchers must make sense of the subjective and socially created meanings expressed about the issue under investigation [19]. In this study, researcher use a qualitative method because with this method we can understand my customers better. Business model is fundamental for a business, for that researcher needs to make sure that Nitya potential customers want to buy our products with our business model plan.

The data collection method that the author uses is a semi-structured interview. Reference [19] stated in a semi-structured interview, the researcher has a list of themes and possibly some key questions to be covered, although their use may vary from interview to interview. The interview will be conducted directly by going to the location of the source. The interview will be conducted with an interview design that has been created by the author. Interview design authors make sure that the interview conducted has direction and data obtained in accordance with research needs. Interview design is made according to [11] Full Lifecycle Use Case which is the need to act, find out about our products, acquire, and pay for our products, use and get value, and tell others. In addition, researcher will ask about farmer's willingness to pay for Nitya Feed and farmer's opinions about Nitya's initial business model.

The population targeted by this study is cattle farmers in the Jabodetabek area. The reason is because cattle farmers are the target customers of Nitya. Precisely a cattle farmer with maximum farm capacity of 50 - 200 cattles located in Jabodetabek.

Purposive sampling is the method utilized by the author. Purposive sampling is preferred by researchers who want to follow a procedure by interviewing a pre-selected and visible group of elites who meet certain requirements. The sampling approach is used to ensure that the interviewee meets the criteria. The criteria in question are relevant with Nitya's target market.

III. RESULTS

A. Cattle Farmers Willingness to Pay for Nitya Product Analysis

One of the things that researchers are looking for through the study is whether farmers want to buy and use Nitya's feed and services. This study found that cattle farmers have different budgets in buying feed during the fattening process. Cattle farmers in the Jabodetabek area have the same provisions in purchasing their feed.

Based on interview results, the budget spent by cattle farmers in buying feed ranges from IDR 1,300 - 20,000/kg per cattle. The breakdown of this budget is to buy concentrates, additional ingredients such as cassava pulp/cassava pulp; beer dregs/soybean dregs; and solid/palm pulp, and tofu pulp. For forage, cattle farmers choose to mow the grass around them. To mow the grass, what is calculated is the cost of gasoline which is included in the operational costs of the farmer.

Since the purpose of this research is to find out whether Nitya's initial business model is in accordance with the preferences of farmers, it is necessary to find out whether farmers are interested in buying Nitya's products or not. Nitya Feed consists of seaweed, bran, corn, cassava, and tofu dregs and costs IDR 5,000/kg. Based on the results of interviews, the following are the answers of farmers:

1. 8 cattle farmers are interested in buying Nitya's Feed because they are interested in its protein content. However, they wanted to conduct an experiment first to see whether the cattle liked Nitya's Feed and whether the cattle experienced significant weight gain.
2. 2 cattle farmers are not interested in buying Nitya's Feed. The first breeder was not interested because the feed they use now is much more affordable and the quality of the feed has been proven. The second breeder refused because they already had a formula that had been developed by themselves

and already had their own feed production site.

3. Based on the above results, cattle farmers in Jabodetabek Area are interested in buying Nitya's feed because of its protein content. However, they all want testing first to make sure cattle like Nitya's Feed and gain weight fast.

B. Cattle Farmers Behavior Analysis

a. The Need to Take Action

Based on the interview, there are some reasons why farmer wants to change their current feed. The first reason is because current feeds are expensive. This results in the total cost incurred by the farmer during one fattening cycle, and it is difficult to take a margin from the sale. The second reason is because of the limited feed stock. This influences the sustainability of the feed. If the stock of the ingredients used is limited, then the farmer will have to look for new feed to replace it. In fact, in one fattening, it is better if the feed used does not change. The third reason is because of slow weight gain. This influences the duration of cattle fattening farmers. If the cow's feed is experiencing slow weight gain, it is feared that when it is sold, the cow will not reach its target weight.

b. Find Out About our Product

Based on the interview results, there are several channels for farmers to get information about new cattle feeds. The first channel comes from a fellow farmer. Farmers in one area tend to visit each other to share information or create a community to share knowledge. This is where farmers share info about new cattle feeds. Further information comes from the Department of Animal Husbandry and Fisheries. Local government, through the Department of Animal Husbandry and Fisheries, often visits and provides counseling to cattle farmers. This visit was carried out to monitor the quality of fattening process cattle farmers do and provide information if there are new cattle feeds that can be used by farmers. Usually, the information provided by the Department of Animal Husbandry and Fisheries is in the form of newfound feed and has just been tested in the lab. The last channel comes from the subscribed store where farmers usually buy their feed. These stores usually offer products that they have just developed or products that are consigned in their stores. After receiving the information, the breeder tends to test the new cattle feed first to find out whether the cattle like the feed or not, then check the weight gaining of the cattle after eating the cattle feed.

c. Acquire and Pay

Cattle farmers have many ways to get cattle feed. The methods used by cattle farmers are different to acquire each type of feed.

To acquire grass, cattle farmers need to mow grass around the area. This process is carried out every day to once a week according to the needs of the breeder and how to fatten it. If through mowing cannot meet the needs of feed, the farmer needs to buy grass from the supplier. The intensity of buying this grass is in accordance with the intensity of the grass mowing process.

To acquire concentrate, cattle farmers buy it from the production plant. Purchase of this concentrate is done once a month. There is also a cattle farmer who has able to make their own concentrate formula and able to produce it themselves.

To acquire additional materials, cattle farmers buy from suppliers of these materials. Additional used by farmers in Jabodetabek are cassava pulp, solid/palm pulp, beer dregs/soybean dregs. The supplier here can be a factory that processes the material or a farmer who grows the material in question. This purchase is usually made once a month.

To acquire tofu dreg, cattle farmers subscribe to a nearby tofu factory. The subscription is valid for one month to one year. Tofu factory will send tofu dregs every day to

farmers according to the tofu dregs available at the factory.

The payment system used by cattle farmers is down payment then repayment and cash on delivery. For the first system, after placing an order, the farmer is asked to pay a down payment, then when the order arrives, the farmer only fulfills the repayment. For the second system, the farmer pays after the ordered goods arrive. This system can be used by farmers if they have subscribed to a shop and the shop already has trust with the farmer.

d. Use and Get Value

Cattle farmers have different ways and formulas for feeding cattles. The feeding session was divided into several sessions: morning, afternoon, and evening. There are two ways to feed cattles. These methods differ by the food provided in each session.

The first way is to give mixed food. First, the farmer will mix all the feed ingredients which in general consist of grass, concentrate, additional material, and tofu dreg. Some breeders give water to the mixture to make it easier for cows to eat it. Then the mixture will be given to the cows in each session and refilled continuously until the feeding session is over.

Another way is to provide different foods in each session. In the morning the cattle will be fed a mixture of concentrate, additional material, and tofu dregs. Then

in the afternoon until the feeding session ends, grass will be given. If the food in the morning has not been finished, it will be cleaned and replaced with food for the next session.

e. Tell Others

There are several reasons a cattle farmer would recommends a cattle feed. The first reason is because related feed can make cattle fatten faster. The thing that is the main determining factor for the success of a fattening process is that the cow reaches a certain weight within a predetermined time. Therefore, the faster a feed can fatten a cattle, the cattle feed is considered high quality. Of course, at a reasonable price. Another reason is the additional effects after consuming certain feeds. For example, the use of solid/palm pulp in cattle feed will make the cow's skin shinier. Those are some farmers that use solid in their formulas. Another example is the use of too much tofu pulp will make the beef contain a lot of water. For this reason, there are farmers who reduce the use of tofu dregs in their feed.

f. Nitya Membership Feasibility Result Analysis

Based on the interview results, Farmers felt that they fit Nitya's initial business model. There are several improvements that must be made to adapt to farmers. First, the price set by Nitya is still expensive, so it is necessary to change the formula or change the supplier to get a more affordable price. Second, free trials must be given to breeders because breeders prioritize authentic evidence that is carried out on their cattles. Third, it is necessary to implement a payment system that does not bother farmers but also does not make Nitya short of capital.

IV. DISCUSSION

Based on data obtained from cattle farmers, there are several adjustments needed to Nitya's initial business model. For each element, here are some adjustments in Nitya's business model:

A. Value Proposition

The value that Nitya offers is "Livestock feed from seaweed with higher nutritional and affordable price for cattle farmers to fasten cattle fattening process". From this value, we hope to help cattle farmers by accelerating the cattle fattening process. Nitya contributes by producing cattle feed from seaweed.

B. Customer Segments

Customer segment of Nitya is cattle farmers located in Depok, West Java which has cattle of 50-200 cows. We target these customers because they are the ones

who experience problems in the cattle fattening process. Based on the interview result, Nitya can expand their market to Jabodetabek Area.

C. Customer Relationship

Nitya maintains a relationship with customers by providing monthly consolidation to control cattle that consume Nitya Feed. Do not forget to provide vet visits to provide countermeasures to sick cattle. Nitya also needs to provide Nitya Feed free trial to prove the product's quality and values. Nitya will also provide down payment system to make it easier for farmers to pay.

D. Channel

Nitya sells their products through three channels: Nitya official store in the form of offline stores, phone calls for approaching cattle farmers directly, and websites for those who want to use us through the internet.

E. Key Activities

The main activity is the provision of raw materials by outsourcing. Then go through our production process: grounding, mixing, and packaging. Then do a food test to make sure our cattle feed is according to standard. We do promotion by giving free trials for cattle farmers and sales to gain revenue. Finally, delivering our product to customers.

F. Key Partners

To realize Nitya's value, Nitya works with several partners. The main partner is raw material supplier consisting of seaweed, bran, cassava, and corn. Not to forget, Nitya also works with packaging suppliers to make their packaging. Machinery Suppliers assist by supplying the machines Nitya uses for production and providing service. Food lab to test Nitya cattle feed and veterinarians to make sure cattle are safe to eat their cattle feed product.

G. Key Resources

Our main resources are raw materials in the form of seaweed, bran, cassava, and corn. Then there is also packaging to pack feed and machinery that supports our production activities.

H. Cost Structure

Our cost structure consists of raw materials procurement, production, packaging, marketing cost in the form of COCA/Cost of Customer Acquisition, and employee salary.

I. Revenue Streams

Nitya main revenue comes from product sales and membership program fees.

V. CONCLUSION

The objective of this study is to determine what kind of business model innovation that can be applied to Nitya. The primary data of cattle farmer's willingness to pay and farmer's behavior collected from interviews with cattle farmers in Jabodetabek. After that, researcher use open coding and descriptive analysis to break down the interview results. Then, researcher continue to adjust Nitya's initial business model according to the analysis results.

The result are farmers have no comment towards Nitya's proposed service but first, the price set by Nitya is still expensive, so it is necessary to change the formula or change the supplier to get a more affordable price. Second, free trials must be given to breeders because breeders prioritize authentic evidence that is conducted on their cattles. Third, it is necessary to implement a payment system that does not make it easier for farmers but also does not make Nitya short of capital.

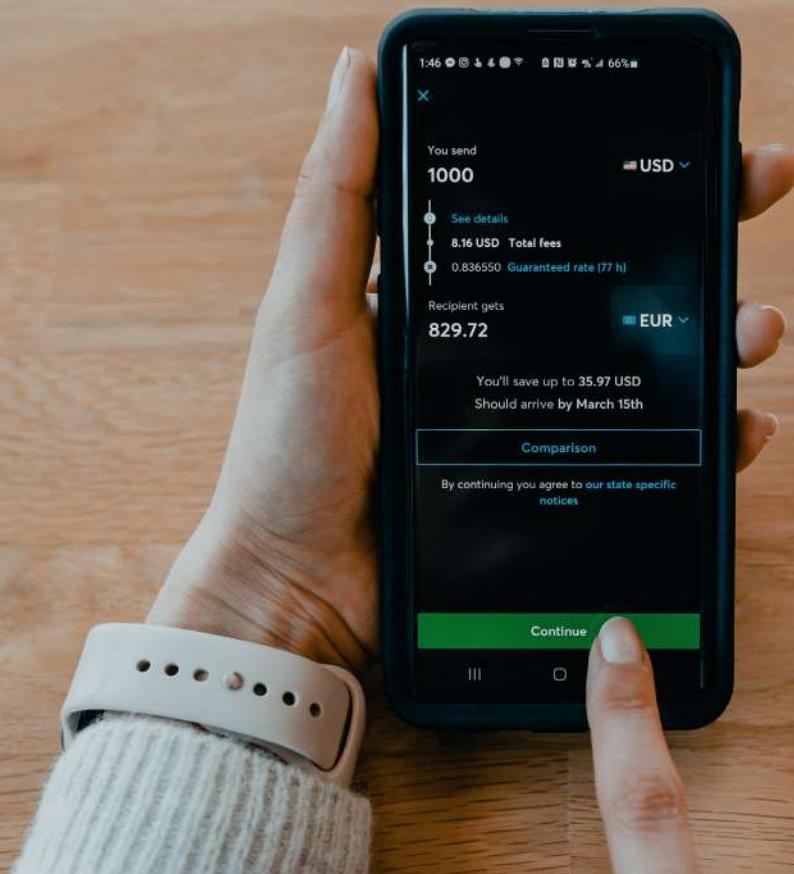
Therefore, the best business model to be applied to Nitya is Nitya's initial business model with several adjustments in customer segments by expanding their market to Jabodetabek, customer relationship by implementing free trial and down payment scheme, new formula by switching corn with tofu dregs. And last adjustment in key partners by adding a tofu factory to align with the formula.

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Paper 66

The mobile banking use behavior among middle-aged consumers: An application of UTAUT2

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Abstract - The pandemic has forced people to use cashless payments more often to reduce physical contact with other people. However, middle age has several considerations for using this technology. This study seeks to ascertain the effect of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, and perceived risk on behavioral intention and mobile banking use behavior among middle age. This quantitative study surveyed 187 middle age (aged 44-60 years old) spread throughout Indonesia. The data analysis technique used is the Partial Least Square (PLS) method. The results showed that effort expectancy, social influence, price value, and habit significantly influence behavioral intention. Furthermore, behavioral intention also affects the use behavior variable.

Keywords - Behavioral intention, effort expectancy, facilitating conditions, habit, hedonic motivation, perceived risk, performance expectancy, price value, social influence, use behavior

I. INTRODUCTION

Rapid technological advances have made it easier for humans to carry out their activities and make technology a vital part of human life. However, sometimes this technological development is not always accepted by all generations. Yang and Shih [1] stated that age affects individuals in embracing technology. Digital development and the movement of different events shaped each generation according to their time [2]. Prensky [3] also says that an individual's background and experience influence their thought processes. Therefore, there is a significant difference between the digital native generation and the digital immigrants. Digital natives were born when there was already digital technology in their early life, so we can assume they were technology savvy. Digital immigrants were born when there was no digital technology yet and are assumed to usually have some difficulties with technology [3]. For the digital native generation, technological development may not be a problem because they are accustomed to using technology. However, this does not necessarily apply to the middle age who are digital immigrants. According to WHO, middle-aged are those aged 44-60 years. Indonesia has 35% of the total population [4,5]. Since the development of digital technology in Indonesia has only

begun from the 1990s until the early 2000s, we define Indonesian digital immigrants are those born before the 1990s. People born before the 1990s usually are more difficult to accept the use of technology.

According to Vodanovich et al. [6], although many generations of digital immigrants have transformed into users who are proficient in digital technology, their attitude towards technology is different from those of the digital native. For example, the digital native tends to be more interested in social media technology. Meanwhile, digital immigrants rarely use social media to socialize or build social relationships. Most of them prefer face-to-face interaction with the other person [7]. Therefore, we can assume that the behavior of using technology in each generation is different. Venkatesh et al. [8] defined use behavior as the frequency of using technology. From the data above, the frequency of digital natives using social media technology is higher than that of the digital immigrant.

One of the applications created to ease transaction activity is mobile banking. The use of mobile banking applications has become increasingly popular. However, the application has not been optimally utilized by digital immigrants. According to research by Farzin et al. [10], the majority of mobile banking users in Iran come from those aged 21-30 years and the least from those aged 50 years and over. Research conducted by Saparudin et al. [11] of mobile banking users in Indonesia are also dominated by those aged 20-30 years (42.4%) followed by those aged 31-40 years (39.1%), those aged 41-50 years (14.8%), and the least of them are over 50 years old (3.7%). This data shows that the number of mobile banking users among the middle age is much less than those who are relatively younger.

To improve mobile banking acceptance among middle age, the banking industry must increase their intention to use the service. Given that mobile banking is a technology-based financial system, a process is needed so that users can be sure to accept and continue using this technology. Therefore, it is necessary to identify factors influencing a person's intention to continue using mobile banking (behavioral intention).

Many researchers have developed the acceptance model of technology, one of which is the Unified Theory of

Acceptance and Use of Technology (UTAUT2) developed by Venkatesh et al. [8]. This model is an extension of the UTAUT model developed by Venkatesh et al. [9] by adding three new variables. According to the UTAUT2 model, behavioral intention is influenced by performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit.

Performance expectations are characterized by the level of benefits from using technology for users in carrying out certain activities [9]. Performance expectancy in this study refers to the extent to which individuals have confidence that the mobile banking services usage will benefit in conducting transaction activities. If the users believe the technology usage can improve their performance, their intention to continue using technology will also increase.

Several researchers have also proven that performance expectancy affects behavioral intention to use mobile banking [10, 12, 13]. Venkatesh et al. [9] also defined effort expectancy as the convenience of technology. The possibility to continue using mobile banking will be raised if the system is user-friendly. To improve mobile banking acceptance among middle age, the banking industry must increase their intention to use the service. Given that mobile banking is a technology-based financial system, a process is needed so that users can be sure to accept and continue using this technology. Therefore, it is necessary to identify factors influencing a person's intention to continue using mobile banking (behavioral intention). We proposed the research framework as follows:

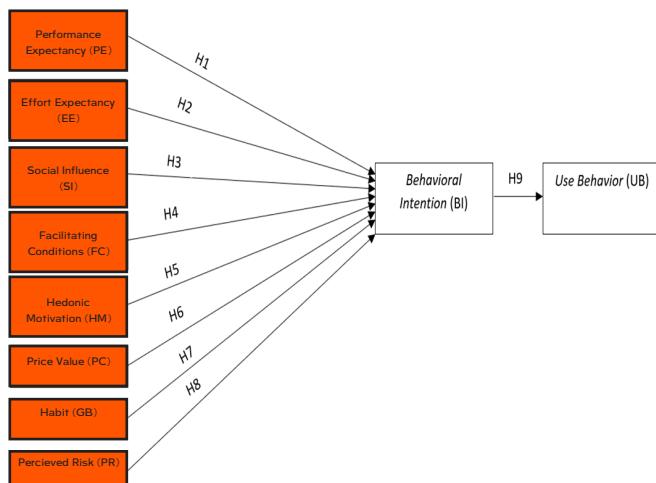


Figure 1. Research Framework

II. METHODOLOGY

The population in this study is the middle age group (aged 44-60 years at the time of the research) who use mobile banking in Indonesia. The sample was determined by the purposive sampling method. Respondent criteria used are the middle age group aged 44-60 years, have used mobile

banking at least 2 times for transaction activities, and domiciled in Indonesia.

The measurement of all variables in this study refers to Venkatesh et al. [8, 9] except for the measurement of the perceived risk variable which refers to Featherman and Pavlou [14].

The performance expectancy variable is related to the extent to which individuals have confidence that using mobile banking will provide benefits to conducting transaction activities [9]. We measured performance expectancy using three indicators. One example of the indicator is "Mobile banking is useful in carrying out various transaction activities."

The measurement of the effort expectancy variable in this study uses four indicators, one example of which is "The mobile banking system is easy to use." One example of an indicator to measure the social influence variable is "Users get suggestions from people to use mobile banking."

Facilitating conditions in this study relate to the organizational infrastructure and technical support available to individuals when using mobile banking. One example of an indicator of facilitating conditions is "Users have a fast internet connection to use mobile banking."

The indicators used to measure the price value variable in this study refer to Venkatesh et al. [8]. An example of an indicator item is: "Users feel that mobile banking has provided the best service for the cost."

Perceived risk in this study refers to the definition of Featherman and Pavlou [14], namely the uncertainty felt by users regarding the negative effects of using mobile banking. The measurement of the perceived risk variable uses six indicator items. One example of an indicator item used is "A hacker might take over the user's bank account if the user uses mobile banking."

Behavioral intention shows a person's desire to continue using mobile banking. A sample indicator used to measure the behavioral intention variable is "Users plan to continue using mobile banking in the future."

The use behavior variable is interpreted as the frequency of using mobile banking. Indicators to measure use behavior include "Users often use mobile banking to perform banking activities."

The data that has been collected is then processed using PLS.

III. RESULTS

A. Respondents' Profile

The number of samples collected in this study is 187 respondents. Most of the respondents are male, well-educated, entrepreneurs, and have income > Rp. 15,000.000.

Table 1 - Respondents' Profile

		Total	%
Sex	Male	102	54.5%
	Female	85	44.5%
Education	Junior high school	9	4.8%
	High School	67	35.8%
Occupation	Undergraduate	111	59.4%
	Housewife	21	11.2%
Income	Private employees	34	18.2%
	Government employees	19	10.2%
Entrepreneur	Professional (doctor, lecturer, lawyer, etc.)	29	15.5%
	Retired	3	1.6%
Entrepreneur	Police officer	2	1.1%
	Entrepreneur	79	42.2%
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Income	< Rp 4.500.000	11	5.9%
	Rp 4.500.001 - Rp 10.000.000	24	12.8%
Entrepreneur	Rp 10.000.001 - Rp 15.000.000	66	35.3%
	> Rp 15.000.000	86	46%

B. Outer Model

The results of the evaluation of the outer model in this study can be seen in Figure 2 below:

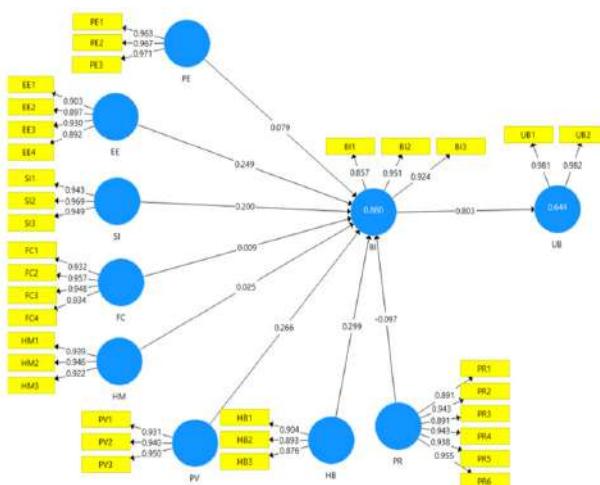


Figure 2. Outer Model

Table 2 - Average Variance Extraction

Variable	AVE
PE	0.936
EE	0.820
SI	0.910
FC	0.889
HM	0.875
PV	0.884
HB	0.794
PR	0.860
BI	0.831
UB	0.963

Table 1 shows that all variables in this study have an Average Variance Extraction (AVE) value above 0.5. This means that all variables in this study are said to have met the requirements of the convergent validity test.

Discriminant validity was assessed using the Fornell-Larcker criterion. This method is done by comparing the AVE root value of each variable with the correlation between other variables in the research model (Table 2). If the AVE root value of each variable is greater than the correlation value between the variables and other variables in the model, it indicates good discriminant validity.

Table 3 - Fornell Larcker Criterion

	BI	EE	FC	HB	HM	PE	PR	PV	SI	UB
BI	0.912									
EE	0.844	0.906								
FC	0.767	0.876	0.943							
HB	0.882	0.850	0.747	0.891						
HM	0.817	0.903	0.882	0.835	0.936					
PE	0.755	0.796	0.843	0.711	0.781	0.967				
PR	0.704	0.748	0.842	0.709	0.789	0.801	0.927			
PV	0.825	0.697	0.593	0.830	0.698	0.620	0.600	0.940		
SI	0.747	0.679	0.762	0.680	0.698	0.758	0.768	0.622	0.954	
UB	0.803	0.632	0.527	0.802	0.621	0.585	0.554	0.912	0.581	0.981

Reliability examination is performed by evaluating the value of composite reliability (CR) and Cronbach's alpha. Each indicator is reliable if the composite reliability value ranges from 0.6 to 0.7 and the Cronbach alpha value is above 0.7 [15].

Table 4 - Reliability Test

	Cronbach's Alpha	Composite Reliability
BI	0.897	0.936
EE	0.927	0.948
FC	0.958	0.970
HB	0.870	0.920
HM	0.929	0.955
PE	0.966	0.978
PR	0.967	0.974
PV	0.934	0.958
SI	0.950	0.968
UB	0.961	0.981

Table 3 displays that all variables in this study have Cronbach's alpha and composite reliability values above 0.7, which means that all variables are reliable.

C. Inner Model

This study used two steps to evaluate the inner model. The first step was checking whether there was collinearity between the variables. The second step was measuring the predictive ability of the model. Figure 3 represents the evaluation of the inner model.

The data processing results showed that all statement items from each variable have a Variance Inflation Factor (VIF) value below 10, which means there is no collinearity between the variables in this study.

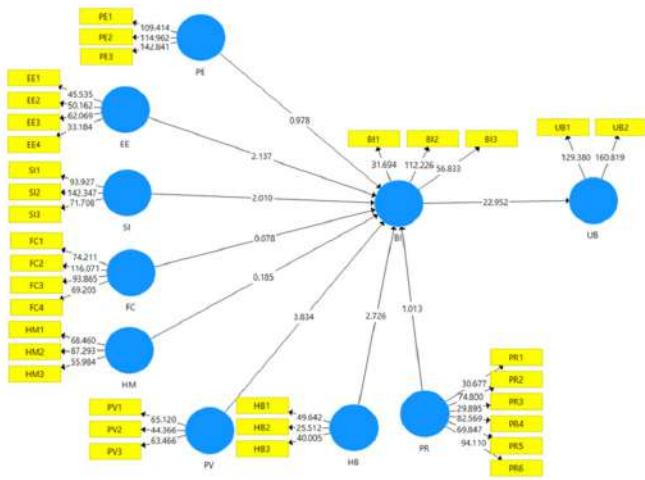


Figure 3. Inner Model

The coefficient of determination is used to evaluate the magnitude of the endogenous variables, namely differentiation, cost leadership, and business performance which can be explained by exogenous variables, namely, market orientation. The results of the R square are displayed in table 4.

Table 5 - R-Square

	Variable		R ²
	BI	UB	
BI	0.860	0.644	
UB			

Table 5. Path Coefficients

	BI	EE	FC	HB	HM	PE	PR	PV	SI	UB
BI	0.803									
EE	0.249									
FC	0.009									
HB	0.299									
HM	0.025									
PE	0.079									
PR	-0.097									
PV	0.266									
SI	0.200									
UB										

Table 5 demonstrates that all path coefficient values are positive, except for PR (-0.097), meaning that increasing exogenous variables can increase endogenous variables. The path coefficient of PR (perceived risk) variables towards BI (behavior intention) is negative at -0.097 indicating that an increase in perceived risk will decrease the behavior intention.

Hypothesis testing was carried out using a bootstrapping procedure and considering the t-statistics value generated from each relationship between variables. This study uses one-tailed and two-tailed hypothesis testing. Eight hypotheses use one-tailed (H1, H2, H4, H5, H6, H7, H8, and H9) and one hypothesis uses two-tailed (H3) because there is no certainty of the direction of the relationship. For the one-tailed hypothesis test, if the t-statistics value is > 1.64 then the hypothesis in this study can be accepted, and vice versa. Meanwhile, for the two-tailed hypothesis test, the hypothesis will be accepted if the t-statistics value is > 1.96. Table 6 shows the results of hypothesis testing in this study.

Table 6 - Hypotheses Testing

Hypotheses	Original Sample (O)	T-Statistics	P Values	Result
PE → BI	0.079	0.978	0.164	Rejected
EE → BI	0.249	2,137	0.017	Accepted
SI → BI	0.200	2,010	0.022	Accepted
FC → BI	0.009	0.078	0.469	Rejected
HM → BI	0.025	0.185	0.427	Rejected
PV → BI	0.266	3,834	0.000	Accepted
HB → BI	0.299	2,726	0.003	Accepted
PR → BI	-0.097	1,013	0.156	Rejected
BI → UB	0.803	22,952	0.000	Accepted

IV. DISCUSSION

The hypothesis test shows that performance expectancy does not affect behavioral intention. Performance expectancy is not strong enough to influence behavioral intention among middle-aged mobile banking users in Indonesia. This result is different from previous studies' results (16, 12, 13; 10) which state that performance expectancy affects behavioral intention. However, these results were following the results of the study by Kwateng et al. [17], and Wei et al. [18] that performance expectancy does not affect behavioral intention. The benefits offered by mobile banking services are not a driving factor that affects respondents' intention to continue using mobile banking. It could be because middle age mobile banking users in Indonesia have not optimized the use of the mobile banking system. The absence of the effect of performance expectancy on behavioral intention can also be caused because mobile banking is not the first payment system introduced to the public in Indonesia. Before the creation of mobile banking, the banking industry had introduced internet banking to the public. Therefore, the public is more familiar with the use and benefits of internet banking than mobile banking. Mobile banking has not yet become a system that plays a direct role in middle-aged activities, especially in transaction activities.

Effort expectancy has a positive and significant effect on behavioral intention. The easier it is to use mobile banking, the higher the middle-aged consumers' intention to keep using the technology. Overall, the high average value of respondents' answers regarding the effort expectancy variable implied that most respondents find it easy to use the mobile banking system. The level of convenience felt by consumers to use mobile banking is essential and will be considered by consumers to decide whether to continue using the application or not. Since the respondents in this study were digital immigrants, they are assumed to have some difficulties with technology. As a result, the convenience factor is a vital consideration for middle age mobile banking users in Indonesia. The results are in line with research conducted by [10,13,19] which states that effort expectancy positively affects behavioral intention. Purwanto and Mutahar [20] also said that customers need technology that is easy to use without much effort.

Social influence manifested in opinions and recommendations from the people around them will influence the intention of middle age groups in Indonesia to continue using this technology. Individuals tend to continue using mobile banking when the people around them (such as friends or relatives) have already used it and shared their experiences. This given experience will indirectly affect and encourage the individual. This encouragement will increase the intention to continue using the technology. This result is aligned with Hussain

et al. [21], who stated that customers feel confident when they know that their friends and family are already using mobile banking. Customers will also be more likely to use mobile banking than go to the bank when the people around them are doing the same.

Most respondents stated that they feel pressure and social influence from the surrounding environment to use mobile banking. The high perceived social pressure will become the impetus for them to continue using mobile banking. The results are also in line with prior research [10,16,22] that social influence has a positive effect on behavioral intention.

Hedonic motivation is not strong enough to change behavioral intention among middle-aged mobile banking users in Indonesia. These results are not following the results of previous studies [10,12,16,23], which state that hedonic motivation affects behavioral intention. However, the results are parallel to the results of Merhi et al. [24] and Hussain et al. [21], which confirmed that hedonic motivation does not affect behavioral intention. The element of pleasure derived from mobile banking usage is not a driving factor influencing the middle age groups in Indonesia to continue to use mobile banking. Mobile banking is a fintech application created to help financial affairs, not to provide elements of fun or entertainment, such as online game applications. In fintech applications, consumers pay more attention to the benefits of helping them transact. Therefore, the fun element is not a consideration to continue using mobile banking. Consumers will still intend to continue using mobile banking even though the technology does not give pleasure for them.

Price value has a positive and significant effect on behavioral intention. The result shows that the monetary costs incurred and the benefits derived from mobile banking usage are important considerations for middle age groups in Indonesia. The results of this study are in agreement with the research of Thaker et al. [13], Farzin et al. [10], and Barata and Coelho [25] which stated that price value has a positive and significant effect on behavioral intention. Most respondents feel that the benefits of using mobile banking are higher compared to the costs. When using mobile banking, sometimes consumers will be charged a service fee (for example, to transfer to another bank). However, respondents feel the costs are relatively small compared to the benefits. With mobile banking, respondents do not need to go to the bank and queue. This method is beneficial and saves their time.

Hypothesis testing shows that habit has a positive and significant effect on behavioral intention. Respondents' answers regarding the habit variable show that most of the middle age groups in Indonesia tend to behave

spontaneously. They use mobile banking as a result of learning or experience. The results of this study are also following prior research [10,13,16,26] which state that habit has a positive and significant effect on behavioral intention. Most of the middle age groups in Indonesia use mobile banking 4-6 times per month. The high frequency of using mobile banking causes the use of technology to become a habit and will ultimately affect their intention to continue using it. According to Ramírez-Correa et al. [27], habits will also increase the ease of use and strengthen a person's intention to continue using the technology. Thus, if individuals are accustomed to using mobile banking, it will be easier for them to operate the technology and in the end, their intention to continue using mobile banking will also increase.

Based on the results of hypothesis testing, the perceived risk does not influence behavioral intention in middle age mobile banking users in Indonesia. The results of this study contradict the earlier research [12,26,28], which stated that perceived risk affects behavioral intention. On the other hand, the results are in line with the results of research by Al-Saeid et al. [29], Rattanaburi and Vongurai [30], and Widjianto et al. (2021), which also state that perceived risk does not affect behavioral intention. The uncertainty regarding the negative effects of using mobile banking does not determine respondents' intention to continue using mobile banking. The high perceived risk when using mobile banking does not reduce their intention to continue using mobile banking because it is so practical and efficient. If respondents want their transactions to be guaranteed safe, they must go to the bank and process transactions through bank tellers. However, it will consume more time compared to using mobile banking. Entrepreneurs often have to carry out banking transactions. If in one day they carry out banking transactions more than once, then to ensure the transactions are safe, they have to go back and forth to the ATM or bank, which is very inefficient and a waste of time. The majority of respondents feel that the use of mobile banking can increase their productivity. Therefore, although most respondents are worried that mobile banking can put them at risk, they still intend to continue using it.

The behavioral intention variable has a positive and significant effect on the user behavior variable. The behavior of middle age groups in Indonesia to use mobile banking is indicated by their intention to continue using the technology. When consumers feel the positive impact of using mobile banking on their lives, they will intend to continue to use the technology. This intention will affect consumer behavior in using the technology, which is shown by the frequency of users using technology. In this study, the majority of respondents intend to continue using mobile banking and this has an impact on the high level of mobile banking usage.

V. CONCLUSION

This study proves that four variables determine consumers' intention to continue using mobile banking. These variables include effort expectancy, social influence, price value, and habit. This result strengthens prior research [10,13,16,19,22,25,27]. The effort expectancy variable in this study has a positive and significant influence on behavioral intention. The convenience level of using mobile banking will affect middle-aged consumers' intention to continue using the technology. The level of convenience is certainly an important consideration because, at the age of 44-60 years, consumers are not as skilled as the digital native generation in using technology. Most respondents use mobile banking because they feel pressure and social influence from the surrounding environment. Opinions and recommendations from people around them will influence respondents to continue using mobile banking. The price value variable also affects behavioral intention [10,13,25]. The relationship between the monetary costs incurred and the benefits derived from using mobile banking is a crucial consideration for middle age groups in Indonesia. Habit also affects behavioral intention [27]. Most of the middle age in Indonesia tend to behave spontaneously. They use mobile banking because of learning outcomes or experiences. However, the user's habit of using mobile banking depends on other factors. Individuals are accustomed to using mobile banking because the individual feels the positive impact of using the technology. The behavioral intention variable in this study also positively and significantly influences user behavior. The frequency of users using mobile banking will be higher if users also have the intention to continue utilizing the technology.

The result of this study provides several managerial implications. First, the banking industry may add new features that make it easier for users to use mobile banking services, such as fingerprint or iris scanner features. Therefore, users can use mobile banking easily, and their intention to continue using these technologies can increase. Second, because social influence is essential, banking can provide additional benefits for users who recommend or invite new users.

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Paper 67

Indonesia`s EV Public Charging Business Regulation in
Creating Nation`s Competitive Advantage

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The 7th International Conference on Management in Emerging Markets

Abstract - Indonesia's aim to reduce carbon emission is reflected through comprehensive policy setting and regulatory acts since the Paris Agreement of global commitment to achieve sustainable future and net zero by 2050. The transportation sector has been the focus to explore for further carbon improvement through Electric Vehicle or EV adoption programs. To minimize carbon footprint in daily transportation, the government has delivered number of incentives and subsidy in effort to increase consumer's preference to transition to Electric Vehicle. In lieu of this attempt, government has committed to build infrastructures around Electric Vehicle ecosystem as the support to meet the growing demand. Through regulations from President and Ministry of Energy & Mineral Resources the government seek to accelerate the infrastructure for Electric Vehicle charging station. Policy's effectiveness and evaluation shall be the focus of the research to ensure charging station infrastructure development traction and implant nation's competitive advantage through charging station.

Keywords - EV, EV charging station, SPKLU, Competitive advantage, Policy evaluation, Business model

I. INTRODUCTION

The global aim to decarbonizing transportation sector is based on the agenda to tackling climate change while sustain development around technology advancement [1]. The race to adopt cleaner transportation technology between many countries become the highlight of every agenda in any sectors. While some countries have successfully managed the transition through intensive policy, others find difficulties to transition due to internal and external conditions of the country. Indonesia as one of the developing economy giants in Asia, has established strong footing in the transition of EV through various policy and incentives [2]. With the projection of EV market reaching quarter-million unit by 2030, the government has committed to build 25,000 SPKLU to meet the demand. The initiatives of government through President Regulation (PerPres No/55/2019) and MEMR Ordinance (PerMen No/13/2020) have specific regulations around SPKLU in aspects of technology, business scheme, regulatory body, and tariff policies. However, practical implementation of SPKLU development has been shown to not expected up to the target as of date only 267 SPKLU have been installed and operated.

The research will break down the policy evaluation and potential analysis through cross-referencing to regulation evaluation literature references and benchmarks to other countries' policies, while empirical approach to the analysis shall be gathered through various interviews with EV charging station players in the country. Furthermore, analysis of competitive advantage will be made in ensuring industry's growth influence on the nation-wide benefits.

II. LITERATURE STUDY

Regulation & Policy Evaluation

Regulation Evaluation analysis of regulation and policies for developing countries in infrastructure sectors have been conducted since the dawn of economy boom in 1990s. Developing countries' pace to attain sustainable growth were influenced by the regulations around infrastructure such as telecommunication, and utility. On that basis, several literature studies have reviewed how the regulations' evaluation could impact the sustainable growth by analyzing the attractiveness to investors, safeguard method to financial institutions, and other stakeholders such as private businesses, state-owned enterprises, and the government.

Based on the Regulatory Governance studies, infrastructure sectors' regulation has played significant roles to incremental development. Being very capital intensive and ergo highly reliable for private investments, there are several criteria which are essential to bring good governance in regulatory system in utility/telecom infrastructure [3]. The criteria are:

- o Clarity of roles and objectives (between Ministry (policymakers) and regulators)
- o Autonomy of regulatory bodies
- o Accountability
- o Participation
- o Transparency
- o Predictability

Continuing the study, Stern's research on Regulation Effectiveness had been performed with detailed studies on approaching effective regulatory function in order to

gain a high rate of investments in important capital sector (such as utility or telecommunication) but also maintain the productivity of the investments, the productivity as highlighted revolves around the tendency of dominant model of dominancy of telco/utility sector by state-owned national monopolies which had been relatively unproductive and unnecessarily high capital-output ratios [4].

Considering stakeholder's safeguard in regulation set up, Warrick Smith has done studies around the importance of single regulatory body of independence [5], which is essential to protect consumers (from abusive dominant power of firms), investors (from government arbitrary action), and to promote economic efficiency.

It is suggested that independent entity (that has an arm-length distance to political authorities and pressure) to be the regulator. As such, regulatory bodies must at least satisfy the following safeguards.

- o Providing regulator with distinct legal mandate
- o Prescribing professional criteria for appointment
- o Involving both executive and legislative parties in appointment
- o Appointing regulators for fixed term and protect them from arbitrary removal
- o Staggering terms so regulations would not clash with election cycles
- o Exempting agencies from civil service salary rules to maintain high-quality staffs
- o Providing the agency with well-funding

Benchmarks

Further analysis is performed by benchmarks of countries resembling similarities with Indonesia for infrastructure development. Equal footing in developing country such as Indonesia, India has also established the need and commitment to EV infrastructure development acceleration to cater the following growing EV demand. The government issued The Government of India's guideline (No.12/2/2018-EV, 2022) to express ambitious program of Public Charging Station (PCS) infrastructure as well as regulation around PCS business [6]. With regards to technology adaptation and enablers, the guideline has instructed specific Governmental & private agencies to become an active supporter, for example, The Public Charging Station (PCS) is regulated to be connected to NSP (network service providers, can be either state-owned or private NSP) with aim to enabling remote booking in

advance to the EV owners/consumers. Other example, the guideline instructed that PCS' consumption data to be gathered, collected, and analyzed by the Bureau of Energy Efficiency (BEE) with State Nodal Agency (SNA). This guideline also complements its function as regulatory basis of tariff, subsidy, and even permit/regulation.

As one of the leading nations in ASEAN for EV adoption and growth, Thailand has set its ambitious target following the Paris Agreement initiatives. Thailand's government has established policies, incentives, and regulation in agenda to moving EV adoption for full growth acceleration. The National Energy Policy Board set operation phases from (1) Preparation for EV utilization as public transportation; (2) Preparation for EV utilization as personal transportation by maturing EV infrastructure; (3) Expansion of EV ecosystem across nation by implementing smart EV charging system, V2G (vehicle to grid) system to optimize demand and supply [7]. Moreover, to centralize data exchange, specification interoperability, and direction to lead EV roadmap, Electric Vehicle Association of Thailand (EVAT) was founded. EVAT is consortium-based organization comprises of different EV players from different industries (providers, utility, energy, machinery/technology, automotive, service) in Thailand.

Malaysia has been leading introduction and initiatives to adopt EV in earlier stage. The government had identified opportunities to include EV implementation in agenda since 2009 when the country officiated National Green Technology Policy (NGTP) [8]. To move forward this initiative, the government set up Malaysian Green Technology Corporation (MGTC) which was founded as agency under the Ministry of Environment and Water (KASA). The agency role is defined as catalyst to ensure the implementation of NGTP while enabling growth. The agency has committed to increase availability of EV charging station significantly. Established partnership with Malaysia's Tenaga Berhad (state-utility company) MGTC launched chargEV as charging solution branding whose focus to lead infrastructure of EV charging station across country.

Analysis of Nation's Competitive Advantage

In assessing industrial leadership in a country, the analysis of Porter's Diamond of Nation's Competitive Advantage is vastly practical. The essence of this analysis was introduced to overview 4 major aspects underlying the competitiveness of a nation in relation to specific industry [9]. The 4 major aspects interrelationship is illustrated below

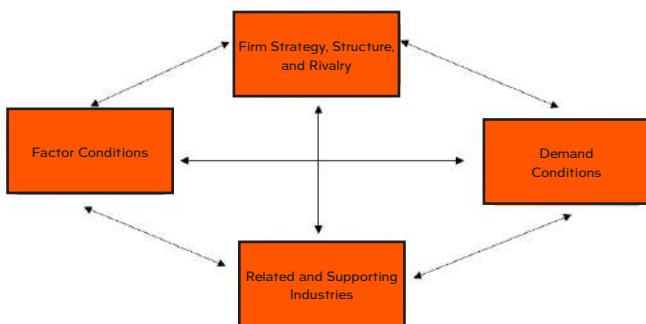


Fig. 1. The Diamond of Nation's Competitive Advantage by Michael Porter [9]

The model encompasses the causes and effects of a certain business innovation that may be effective to a nation and/or might not be possible in others. The overall idea of the Porter's Diamond is also applicable to companies in certain industry within a country to assess the market's prominent potential and future growth since the development of the business is highly reliable of the factors as mentioned in the Diamond.

III. METHODOLOGY

This research will align its focus through qualitative approach to review and evaluate the business regulations around EV charging station (SPKLU) Activity to addressing the research questions shall be fulfilled by three methods.

- 1) The first method will utilize literature study which focused on policy evaluation for developing countries and enable the similar assessment to the current policies and regulations in Indonesia. The analysis will be continued by comparing benchmarks and reviewing lessons learned from other countries with more mature EV industry.
- 2) Qualitative observation through interviews shall be conducted to gather feedbacks from related industry-players within Indonesia which comprise of different stakeholders (private and government)
- 3) The analysis by using Diamond of Nation's Competitive Advantage [9] of policy performance will be cross referenced with benchmarks to synthesize recommendation in meeting the nation's target and to create nation's competitive advantage through EV charging business development.

IV. RESULTS

A. Findings and Arguments

The Government-issued policies and regulation shall be examined to establish how the regulation may satisfy the mentioned criteria. The criteria are gathered in two matrices to establish overlapping purpose and with which, the key indicators are combined and defined.

MATRIX 1

Key criteria of John Stern performance evaluation model [3]

1. Clarity of roles between Ministries and regulatory bodies
2. Autonomy of regulatory body
3. Accountability
4. Participation
5. Transparency
6. Predictability

MATRIX 2

Key criteria of regulation to safeguard stakeholders [5]

- a. Providing regulator with distinct legal mandate
- b. Prescribing professional criteria for appointment
- c. Involving both executive and legislative parties in appointment
- d. Appointing regulators for fixed term and protect them from arbitrary removal
- e. Staggering terms so regulations would not clash with election cycles
- f. Exempting agencies from civil service salary rules to maintain high-quality staffs
- g. Providing the agency with well-funding

Table 1 - Key Indicators to Determine Regulation Performance based on Stern and Smith Matrices

No	Key Indicators (KI)	Matrix Criteria Fulfilment	Remarks
I	Determination of autonomy regulatory body with clear scope, responsibility, and mandate	(1), (2), (a), (b), (d)	Aims to streamline regulation and ensure decision-making to gain focus and traction in industry development
II	Clarification of underlying law power and assurance of safe & fair business practices	(3), (a), (d), (f)	To ensure clarity of law underlying the regulation which will safeguard investors, and business owners from any misconducts
III	Wide involvement level between stakeholders (government agencies, private sectors, law officers, investors, suppliers, landowners)	(4), (5), (c)	By leveraging widespread benefits between parties, industry will gain traction for development and innovation
IV	Deep-rooted / steadfast long-term plan & roadmap to ensure sustainable and continuous positive impact	(6), (e)	Foundation for politics-free policy and safe business conducts without negative external influences
V	Strong financial background & support to maintain regulation's performance and implementation	(f), (g)	Required as the financial safety-net and assurance from government to keep the industry running

Based on Table 1, following evaluation has been selected to see how the policies around EV charging station business in Indonesia (President Regulation Perpres No/55/2019 and Ministry MEMR Ordinance PerMen No/13/2020) shall satisfy the key indicators.

- o The need of autonomous regulatory body has been fulfilled by the government mandate to PLN however

based responsibilities have not been cleared during implementation and business practice. The government needs to clarify further on the roles & responsibilities of PLN as the single-authority to lead the infrastructure of SPKLU while maintaining and fulfilling its task to liaise with private-sectors, other SoE and agencies for supporting EV charging business developments.

- o Assurance of rules and law authority has been expressed by clear rules and sanctions from the Ordinance PerMen No.13, 2020. However, to ensure safe business practice and gain investor's trust, fair regulations need to be addressed to all stakeholders (including private business, SoE, auto-makers, law authorities, regional and national government). Clarification of law will prevent any business misconducts and unfairness of business model between stakeholders thus creating healthy business environment to grow and attractiveness appeal to investors.
- o The policy and regulation have mandated the need of wide level of coordination and cooperation to involve all stakeholders, however the current involvement is only limited to socialization, and training, with no specific level of engagement in the regulation.
- o Grand strategy and Roadmap are key factors to maintaining the course of business growth. While clear roadmap is currently absent, the government has set its target to achieve the goal in foreseeable future. With this ambitious goal, the roadmap should be clarified with clearer timeline, program definition, stakeholders' involvement, and cross-function policies in ensuring well execution.
- o Financial assistances are crucial as strong foundation to boost the infrastructure and deliver good quality of product and service to citizens. Although incentives and subsidies have been granted by government of Indonesia, the government still needs the additional push of investment from private sectors both locally and abroad. The policy needs to indulge attractiveness towards investors and ensuring safe business practice for a sustainable fund support.

B. Interview & Data Collection from Stakeholders

In continuation of the policy evaluation, interviews are conducted with key industry players in Indonesia in development of EV charging stations. The following interviewees played important roles in addressing issues, roadblocks, while giving feedbacks to the current regulation (through survey).

Table 2 - Interviewees' Information and Background

Interviewees*	Company & Background
Mr. SG	PT. Jababeka Mr SG is manager for development and new businesses in PT. Jababeka (industry-estate enterprise) based in West Java region, Indonesia.
Mr. PF	PT. PLN (Persero) Mr PF is involved primarily in the Strategic and Business Development syndicate in the State-owned Utility Enterprise PLN. As part of the S&BD function, the department is in charge for the development of SPKLU infrastructure in Indonesia as mandated by the government.
Mr. ER *) Anonymous for privacy protection	PT. Exelly Elektrik Indonesia "EVCuzz" Mr ER is the founder and CEO of the start-up venture EVCuzz based in Indonesia. As one of the pioneers in EV public charging, the company seeks to expand their business nation-wide.

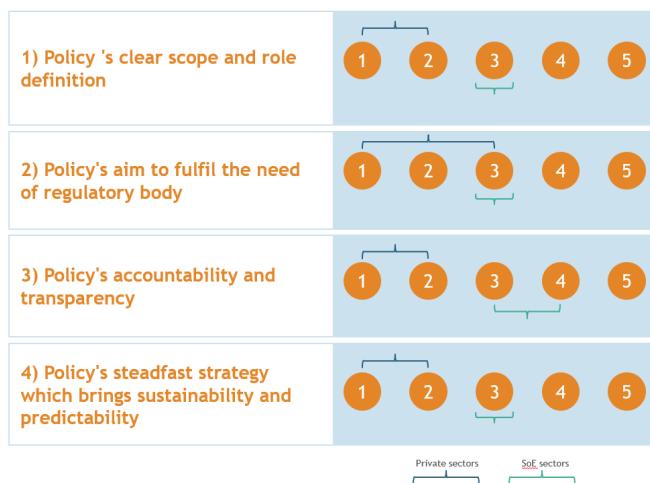


Fig. 2. Survey Result on Existing Regulation Feedbacks

The interviewee's diverse background also encompasses different messages and takeaways going into the interview, with different and unique remarks addressing the current industry issues of the ecosystem [10],[11],[12].

a. Business Challenges

- o No clarification and rules for revenue and profit sharing
- o Fixed tariffs are still not profitable for type 3 EV chargers which present more expensive product

b. Unclarified role and responsibility

- o Many enterprises in Energy played different

approaches to captivate EV charging business opportunities: without clear role & responsibility

- o SoEs and private sectors invent own application for EV charging facility which are not interactable
- c. Slow market growth
- o The market of EV has not been growing with quite the expected pace; therefore, investment in the infrastructure has also been relatively slow
- o Government's incentives to reduce EV price has not been significant to meet the market's purchasing capability
- o Localization attempt for boosting EV numbers in Indonesia have not been successful

V. DISCUSSION

Continuing the analysis of policy review, the industry of EV public charging stations shall be examined by implementing analyses on the 4 main components in the Porter's Diamond for Competitive Advantage. The current conditions of the evaluation shall give recommendations and improvement focus in the sector to achieve the nation's competitive advantage.

1. Factor conditions are broken down into 3 major aspects with the following assessment
 - o Material availability has been supported by the technological introduction to Indonesia unfortunately the OEM manufacturers are still based outside of Indonesia
 - o Human resources are vastly available however require proper education / training and skillset to implement the knowledge & know-how to the technology
 - o Knowledge of basic know-how has been familiar limitedly to amongst EV charging business players, unfortunately knowledge for EV charging integration and communication for data exchange enabler is still limited
2. Supporting Industries comprised of 4 major foundations
 - o EV charger (OEM) portion, which comprised of the key components in EV charger. The OEM value stream has been weighted heavily in variables in import activities. This also leads to relatively more price per unit which heavily contributes to the business' profitability ratio. EV Charger supplier spans from different region comprising of famous brands and name such as Delta, ABB, and Schneider which provide best solutions in charging facility, however, based on existing pricing on the charging

units, investment on EV charging is still both risky and has long payback period in nature.

- o Electricity played essential role in meeting the continuous demand with stable supply and set pricing. The main source comes from electricity grid which is regulated, operated, and managed by the PLN distribution and transmission. With the current plan to expand EV charging station in nation-wide scale, electricity supply must be widely available across region. The PLN roadmap to achieve 35,000 MW and 100% electrification ration has been set and executed with good achievement however the plan was still on-going progress with 33% of power generated target in COD & installed stage and 99.46% electrification ratio achieved (Gatrik, 2021). Expansion would also not be enough due to the fluctuated demand condition by the charging electricity. The need of smart grid would influence flexibility and adaptability of the grid to fulfil the EV charging demand in anytime. Later stage shall be explored to implement V2G system (vehicle to grid) which would be substantial development to the EV ecosystem.
- o The land availability and EPCs as the two significant value stream foundation also play important roles. Land (or space)for EV charging location is abundantly available in Indonesia - although there might be scarcity of ideal location within densely populated city such as the capital city Jakarta, EV charging stations are quite flexible to be installed in parking area, terminals, offices, apartment/high rise building, malls and many else. Construction companies (EPCs) are quite varied and available for providing expertise and capabilities in building the facility. EPC companies are available from both private and state-owned sectors which brings many opportunities to accelerate EV charging infrastructure. The high competition and variance in the EPC companies also brought development of know-how, material and skill set in building / facility construction.
- 3. Demand conditions directly reflects to the EV users projected growth and market condition. With various externalities influencing demand, the business projection for EV is currently blooming with expected value of 250,000 units by 2030 [1]. However, there are many considerations underlying the demand influence which can ultimately alter the outcome [13]. These considerations include Financial Attributes (price, expenses of adoption) Technical Attributes (driving range, charging time, engine power, and many else) Infrastructure Attributes (EV charging station), and Policy Attributes (Taxes, other legal issues related)

4. Firm structure & rivalry pertains to the key industry players which dominating the EV charging players at the moment. The following players come from different background however placed similar interests in tapping into new EV ecosystem infrastructure of charging station. These players include PLN (Utility state-owned company), Pertamina (Energy & Oil state-owned company), BPPT (research and development agency from the government). There are also more players from automakers such as Hyundai, Mitsubishi, BMW and Mercedes Benz that seek to increase brand awareness for EV transition. Private enterprises have tapped into the EV charging ventures which include prominent start-ups such as Starvo, and EVCuzz. The industry players have different background thus adapting different strategy for developing EV public charging stations (as shown below). Additionally, with the 10 business schemes introduced by MEMR Ordinance PerMen No/13/2020, the government needs to examine the business players' preference into the industry through supportive incentives and subsidy in order to grow the healthy competition to the business.

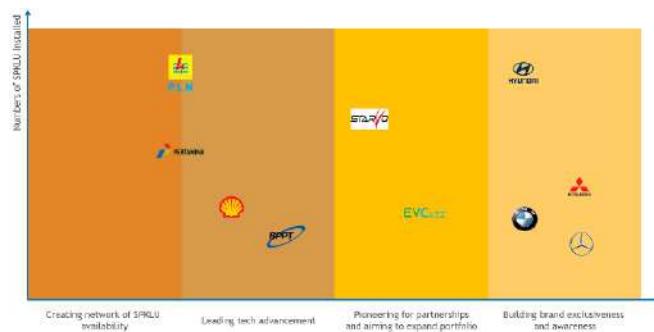


Fig. 3. Strategy categorization of EV charging players in Indonesia

VI. CONCLUSION

The EV charging infrastructure is key component factor in ensuring growing EV industry transition in the future. With regard to the policy evaluation by Stern and Smith, the research examined the missing key indicators' essence within Perpres No/55/2019 and PerMen No/13/2020 to understand the gaps to improving the regulation in answering the infrastructure goal. Moreover, benchmarks have been synthesized in understanding the differences and innovations from other countries with more mature EV adoption stage in order to capture lessons learned and success story (as shown in the table below).

Table 3 - Benchmark of Policy & Strategy Comparison

EV Charging and EV Adoption Strategy	Implementing countries (*)
Government incentives for taxes in EV charging stations, road, and other infrastructure	
Roadmap for increasing electric vehicle production and transition	
Roadmap for EV charging infrastructure	
Single autonomically and inclusive body which leads EV charging infrastructure	
Integration of utility company to specify grid control and smart grid system implementation	
Business schemes for EV charging station to ensure scope of roles and responsibilities	
Clear EV charging technology specification, adopted models, standards, and system as acknowledged by the country	
Rules and sanctions for misconducts in business practice of EV public charging station	
Government's demand-pulling and technology-push strategy to solve the 'chicken-and-egg' dilemma of EV charging station	

In summary, the following recommendations are proposed for implementation in fulfilling the identified gaps through policy evaluation, benchmarks, and conditional analysis through Porter's Diamond model.

Furthermore, implementation plan shall be evaluated based on the recommendation's priority mapping on ease of implementation and duration factors in order to capture the best outlook for the EV charging infrastructure development in Indonesia.

1. EV Charging infrastructure development needs to be led, overseen, and monitored by single autonomically regulatory body which has government support, inclusiveness, accountability and best-practice and expertise in adhering to the latest technological approach to ensure development in industry.
2. The regulatory body shall act as a forum of communication for all stakeholders (state-owned enterprises, private EV charging stations, EV charging machine OEM, automakers, software developers, and EV users' community) to address situation on the progressing EV charging development to ensure prevention on any misconducts, maintain regulation effectiveness and sustainable business practice.
3. Clear Roadmap on EV infrastructure (include charging station, battery swapping, battery waste management system, and many more) which shall include clear timeline, involved stakeholders, and implementation action program required.
4. Active demand-pulling and technology-push from the government by prioritizing infrastructure (EV charging station) development which will influence the rise of EV adoption in Indonesia. While the demand in EV will continue to rise, the infrastructure readiness needs to be placed as priority for the government to ensure market fulfilment.

5. Maintaining the healthy competition landmark for EV charging business in Indonesia. As depicted in Chapter 3, the varying EV charger industry players in Indonesia bring innovations and advancement which are crucial for the EV industry – therefore the government's (and autonomically regulatory body) roles are to ensure safe and fair business practice to boost uniform growth across players.

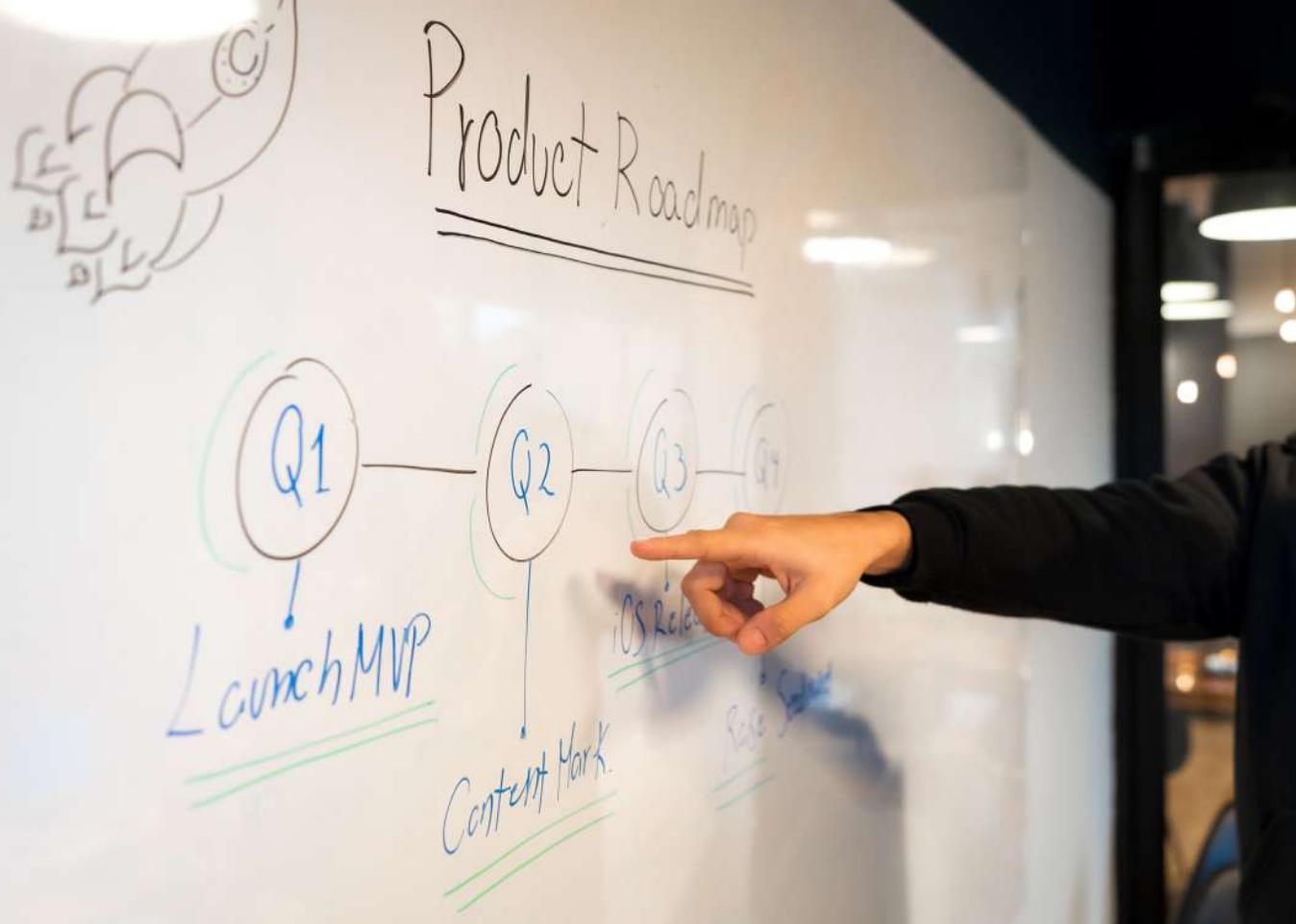
6. Continuing improvement while bringing cost leadership, government needs to support research and continued development to adopt EV charger technology which can be manufactured in Indonesia. Through BPPT, R&D will lead to bring local innovations which will drive growth of the business.
7. The identified ten business schemes as coordinate in Ordinance PerMen No.13, 2020 have been useful to segregate roles and scope of responsibility. Further analysis in Chapter 3 has summarized the rationale process of each business scheme implementation to each player under certain condition. Access to land, technology and knowledge must be secured and prioritized to all EV charging players by the regulatory body and the government to ensure business growth and leaderships from all different business models.

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Paper 68

Seed Round Fundraising on Financing Early-stage Startups in Indonesia

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ICMEM

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Abstract - Early-stage startup growth has become the main focus of Indonesia's government in driving economic growth through the digital business adoption. However, running out of cash or failing to raise new capital is still considered as the main obstacle for early-stage startups in growing and maintaining their business in the market. The difficulties faced by early-stage startup founders due to the lack of financial projections and misvaluing their business in convincing potential investors to get funding. This study focuses on early-stage startups getting funded through seed round investment as getting funded by financial institutions is not an option due to the intangible assets early-stage startups have. Moreover, the objective of this study is to examine the parameters of loans, credit, and funding in organizational and institutional settings. The study was conducted by interviewing startup founders who have gone through and successfully secured seed investment. The result of the analysis shows eight indicators influence investors in determining their investment. By optimizing these indicators, it is expected that early-stage startups become easier in obtaining funding especially in setting the best optimal amount of money to fundraise for their business sustainability.

Keywords - Early-stage startups, seed round investment, investors

I. INTRODUCTION

Startup is defined as a newly established company that aims to solve a client's problem through the involvement of innovation in its product offering (Baldridge & Curry, 2021). The early stage of a startup has become a center of attention of the Indonesian Government with the growth of digital business as the main focus. The growth of startups has been increasing rapidly from 1,400 in 2017 to 2,200 in 2019. However, the number of startups that succeed in the business is considerably low – accounting for 1% of success rate. The driver led by several factors such as, the inability of a startup to achieve product market fit, ran out of cash or failed to raise new capital which took a proportion of 35% and 38% respectively.

In regards to running out of cash to raise new capital for the business runway, it raises a question on how startup founders should manage the business on the financial aspects; (1) how much to raise and (2) the valuation of the company. The two factors linked to one another. On the

one hand, startup founders need to determine the optimal money raised to achieve the next x months milestones. On the other hand, startup founders need to define their business worth and how much equity they want to sell in regards to the money they need. It leads to startups common mistakes under these factors; the inability to project the money needed and/or overvalue their business.

On the bright side, early-stage startups receive more interest from institutional investors (venture capitalists) with receiving 70 deals or approximately 50% of seed investment by 2020 according to Indonesia Digital Lookbook. It could be analyzed that venture capital prefers to invest in early stage startups to receive higher return, although with higher risk. The difficulties faced by the startup founders to get funding from banks or financial institutions caused by the majority of the startup founders holding intangible assets so that banks and financial institutions find it difficult to calculate the credit risks (Rizal et al., 2019). Hence, receiving funding from investors has become a common option. This is supported by the existence of venture capital and angel investors in guiding and investing money to startups through convertible debts, safe, or equity.

Theoretical foundations

Early stage startups are newly established company that are still trying to achieve a product-market fit through their offering of a problem in the society. This could be through testing the products and services of the firm through Minimum Viable Product (MVP) feature set and traction insights translation (Ries, 2011).

Seed financing is marked as an equity financing (Reiff, 2022). Therefore, through this method, startup founders will give up some of equity ownership of the company to the investors as an exchange of investment needed by the company.

There are two types of investors in this stage, angel and institutional investors. Angel investors invest in startups through an equity contract with the amount vary based on the angel investor and firm's need (Berger & Udell, 1998) with prioritizing safety of the investment. However, during the seed round, angel investors would probably contribute a rather smaller amount compared to Venture Capital group (Cremades, 2018) due to the limited financial capacity (Jiang, 2020).

II. METHODOLOGY

This study used the qualitative method. Data obtained through interviews and secondary data research that will be analyzed through content analysis. Using a convenience sampling method, there are five selected respondents. These respondents under criteria must be the technology-based startup founders that have received seed round investment within the last six years in Indonesia. Importantly, selected respondents agreed to be interviewed and become part of the research. The respondents were contacted through social media (i.e. Instagram, LinkedIn, and Whatsapp) All participants accepted to have a video and audio record interview. Each interview followed a semi structured script which contains several questions related to the indicators used in this study.

A deductive approach is applied using existing theories to find out whether the indicators can be implemented in startups in Indonesia focusing on factors that determine the right amount of money to fundraise and the valuation of a startup in seed round. The study used Cunningham et al. (2008) and Rizal et al. (2019) to divide factors into two variables which are parameters of funding and organizational and institutional. The first factor is to analyze a startup's growth phases and its way of generating income. The second parameter is to analyze a startup's capacity to deliver loans. These indicators will be analyzed whether they can be applied as the indicators that influence the funding of startups in seed rounds in Indonesia. The research variable and indicators can be seen in **conceptual framework and table 1**.

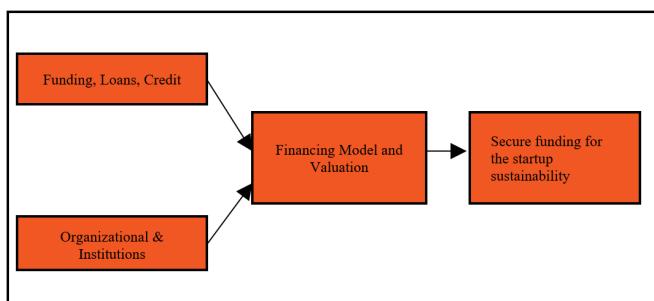


Table 1. Research Variables and Indicators

Variable	Indicator
Funding, Loans, Credit	Business Stage
	Investment Period
	Financing Model and Valuations
Organizational & Institutional	Owner's Profile
	Market Opportunities
	Competition in the market
	Transnational
	Portfolio Company's Profile <ul style="list-style-type: none"> 1. Growth-oriented venture 2. Promising / prospective 3. Innovative / Entrepreneurial firms 4. Future profit, future wealth, future cash flows

Open coding was conducted and quotations were labeled into one to four word labels. After that, close coding was conducted to reduce the number of codes eliminating repetition of similar codes, comparing with original data for accuracy and validation with the usage of software.

The results of interviews in the form of audio will be converted into text or commonly referred to as verbatim transcription. After the transcription, the data will be reduced and put into categories according to the research objectives through the variables and indicators. Data that has been reduced and presented systematically will be concluded and verified. Lastly, the researcher gives her views and perspectives on the research findings.

III. RESULTS

A. Business Stage

The results of the study shows that in terms of the business stage, startup founders who aimed and successfully received the seed investment are those who already had prototype/ traction / product. Respondent 1 explained, "we already have a prototype and want to build the product to become more reliable". According to respondents 2, "Before fundraising to venture capital, we already have the tractions and products". Then respondent 3 added, "When we were bootstrapping, we wanted to build the product and the traction, because we don't want to fundraise when it is just an idea. So once we have the product and traction

we do the fundraise". These statements are in accordance with the research of Kuschel et. al (2017) which explained that an entrepreneur or in this case the startup founder obtains capital based on their startup stages ((product development, prototype, market validation, scaling)

B. Investment Period

The result of the study indicates that the estimated amount of money to be fundraised by startup founders is based on the cost they need to achieve the milestones (i.e. hiring people, product development, and marketing) and the burn rate. According to respondent 3, "Rule of thumb, usually startups know how much money they need and they usually raise for 12-18 months of runway." Startup runway refers to the amount of time and money a startup needs to stay afloat if it doesn't raise any extra funding. Hence, it is important to investors, a startup founder could demonstrate the period of the business until it can reach the next milestones. These statements are in accordance with the research of Ralston (2016) which also mentioned that the goal of funding is to raise as much as money to get into the next "fundable" milestones.

C. Financing Model and Valuations

The result of the study shows that the amount of money a startup asks for and raises directly impacts ownership percentages. The valuations of the startup will also be the determinant of how much money a startup will end up raising as. It refers to the valuations becoming the drivers of how much equity a startup would give to the investors in return for the capital it raises.

Determining valuations has always been a subjective method and there are numerous approaches to get it. 4 out 5 of the respondents claimed that they did not set a multiplier through the process of valuation setting. They did a benchmark to similar competitors within and without Indonesia. According to respondent 2, "we did not have to determine the multiplier. At that time, we only have to determine the money needed by our startup and how much equity we want to let go." he also explained that, "we also take a look at the competitors' valuation within our industry. Hence, our amount of money proposal won't be looked at as outliers by the investors."

Respondent 4 added with a similar approach but with a multiplier approach in determining the valuation, "we benchmarked to the business that is already in the market and the easiest we can see is through the public market. However, it is not an apple-to-apple comparison as they are mature startups so the multiplier would be smaller. So we just look at the benchmark, for instance, seed investment usually has a higher multiplier (15-20 times) Also, we looked at the industry, is it fast moving? As it

also influences the amount of multiplier. For the valuation, we took a look at the revenue per annum, what was my per annum (revenue generated) and multiplied with the multiplier to get our valuation. Once we got the valuation, we determined how many we want to sell the company." These statements are in accordance with the research of Stankevičienė and Žinytė (2011) which also used financing models as a way to calculate company valuations in terms of investment track record.

Method	Description
I	<ul style="list-style-type: none"> 1. Determine how much money needed 2. Benchmark to competitors' valuation and determine how much equity to sell to investors.
II	<ul style="list-style-type: none"> 1. Determine how much money needed to scale 2. Determine valuation by multiplying revenue or forecast per year with the multiplier based on the benchmark to similar companies in the public market. Afterwards, determine how much equity a <u>startup</u> want to sell to the investors <p>Enterprise Value of peers/Sales = Multiplier</p> <p>Company valuation = Sales * Multiplier</p>

D. Owner's Profile

The result of the study shows that a founder's background is one of the top three important factors during raising an investment. This point is considered as important because investors would want to know how well the founder's capability in running the company and the team in handling possibilities that might occur along the process.

According to Respondent 1, "Investors would want to find out if the founders are experts in the startup's industry they are building (i.e. a logistic startup needs to be built by an expert in logistics)". Respondents 3 also added, "For the Seed round, the most important element is the team. If you have a strong team, no matter what happens, especially during the ups and downs (need to pivot, innovate the current product, etc.) your team can navigate the challenges. That's why when we're pitching, the second slide directly shows who the team is and how this team can execute better than anyone else".

Another point of view also added by Respondent 5, "Investors would highly likely to invest in a startup which is

led by a startup founder who has a good track record on the previous startup." These statements are in accordance with research of Botric and Bozic (2017) which states that future expectations could be seen from previous experience. In this case, it is the previous experience of the founding team that is critical in bringing the startup to success.

E. Market Opportunities

The result of the study shows that founders have shown significant growth in traction. Respondent 2 explained, "When we launch our features, we receive significant growth of demand and do repetition order. Hence, we believe that we launched a feature that the market needs and see the potential of the business model." Respondent 4 added, "In regards to my two sided business platforms, we had different matrix that we want to show, (1) the growth of supply : to show how fast we are capturing the number of sellers, (2) number of transaction and we already doing this on a daily basis, so we grew from 10 to 15 to 30 very quickly. In general, we show the overall growth rate. (3) the number of website visits, the engagement and the awareness."

In addition, supported by Rizal and Hatamimi (2019), if a startup has achieved a good market reach, it will add to the valuation of the startup. Therefore, the potential targeted market will contribute as a rating factor. These statements are in accordance with the research of Shah and Shah (2017), which explained that the market conditions and opportunities attract the attention of the investors and make it easier to get funding.

F. Competition in the Market

The results of the study shows in selecting a startup that is worth to be invested and be valued high in seed round, startups need to identify how its product could be differentiated from other players. Respondent 4 claimed, "One of the factors that could drive funding is the industry of the startup, the competitor landscape. If there is only one competitor it is still considered a blue ocean, if it is very saturated it means it is not the right time for VC investment, it is too late." These statements are in accordance with research of Stankevičienė and Žintytė (2011) which states that the higher the product differentiation in an industry, the higher the valuation of a startup.

G. Transnational

The results of the study shows that startup founders seek for a product that can answer people's needs and to what extent the product can be scaled up and reach a wider market. Respondent 2 explained, "Our startup offered a

product to solve two-sided customers. 51 million people per year face significant legal problems and 71% give up to fight for their rights. On the other hand, we also help lawyers in getting clients as they are not allowed to do any marketing purposes. Therefore, through our platform, we connect lawyers in their specialties to help people who face law problems through a 30 minutes conversation." Respondent 5 added, "When we launched our product, we launched it to solve the problem we faced. Little did we know it was also helpful towards other people through the product acceptance in the market through the high number of users to our platform." These statements are in accordance with research of Dumitrescu (2014), which stated that to obtain thematic funding opportunities, small and medium enterprises need to present sustainable, transnational, and value-added.

H. Portfolio Company's Profile

The study shows that having a good storyteller of how a startup would achieve a significant growth in the future to get a chance of getting investment and increase the valuations. According to Respondent 2, "During the fundraising, we storytell of how the business plan will grow. How is the financial impact? For instance the revenue and operational matrix. Overall, this will be supported for financial projection on how we will achieve in the future with the money needed." Respondent 4 also added, "To convince the investors, we support our business through the business model, the monetization plan, and how scalable the business is".

In addition, respondent 1 also claimed, "a good storytelling strategy is one can create a Fear Of Missing Out situation (FOMO) through the product and people behind it." This is suitable with the research of Stankevičienė and Žintytė (2011) which uses the promising and future profit level as one of the sub-criteria of the investment valuation factor.

V. CONCLUSION

To conclude, seed round investment has become one of the ways for early-stage startups to receive money to fund prepared scalable milestones. During this stage, it is vital for startup founders to understand how much money is needed to fund their startup. It is where startup founders could analyze the cost of their next milestones and monthly burn rate and present this way : "We need to achieve milestone X. In order to get there, we'll need Y people and Z capital to get there. We estimate it will take us W months to get there." In addition, the valuation plays an important role in a startup's funding. Valuation will be determined as it becomes the drivers of how much equity a startup would give to the investors in return for the capital it raises. As valuation of a business is subjective and fluid, hence, negotiation often happens. It

is supported by several factors such as money needed to achieve goals, prior background of the founders including the team supporting the business, tractions, how likely the company will achieve its profitability, the growth rate of related industries, and the "going rate" of comparable companies in convincing investors with the valuation being raised.

In this research, there are two streams approaching differently when it comes to setting the valuation; (1) the usage of multiplier to the annual revenue and (2) compare the business to other startups' in the industry that were able to close to the similar round. Both approaches worked out based on the interviewees' experiences. However, the silver lining from both approaches is to conduct market research and inquire about valuations that some direct or indirect competitors had when obtaining funds at the same time to avoid the valuations request to be overvalued by the investors. In addition, having supporting data points such as a financial forecast (projected income and expected growth) to show the reliability of the business will strengthen the startup's founders' standpoint. It will show how the fundraising could help the investors to see the forecast of how the money is being put to use and the impact the company will get in the long term plans.

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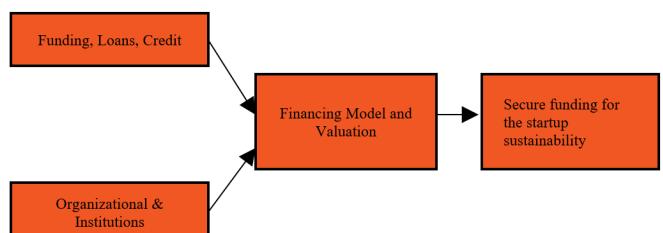
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Paper 69

Proposed new product development of asset management system for healthcare facilities using design thinking and lean startup

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ICMEM

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Abstract - An excellent health care delivery is highly associated with good hospital asset management as it is detrimental to patient safety and satisfaction. To guarantee the conditions are always ideal, hospital assets, particularly medical devices, need to be carefully managed and maintained. In Indonesia, the importance of asset management in hospitals is emphasized through Permenkes 1189/Menkes/Per/VIII/2010. However, given that hospitals have hundreds to thousands of assets of various types, management faces numerous difficulties in carrying out daily operating activities from the perspectives of asset productivity, security, and safety. Asset management in Indonesian hospitals is frequently carried out using Microsoft Excel and paper-based forms, which is inefficient for handling a large number of assets. Design Thinking and Lean Startup methodologies will be used in this study to look at what Indonesian hospitals specifically need regarding asset management system and to deliver the desired system to customers' hands faster. Inability to report accurate asset information is found to be the biggest pain and transparency of asset data is found to be the most desired gain. Based on the customer pains and gains, a mock-up MVP of hospital asset management is built with seven features that act as the pain reliever and gain creators.

Keywords - Asset management; Design thinking; Healthcare; Lean startup; Hospital asset; Product development; Value proposition

I. INTRODUCTION

In the past few years, hospitals around the world have been facing a significant increase of patient load due to COVID-19 pandemic. Healthcare facilities are challenged to address their medical issues while still trying to save money and resources [9]. With the rise of the in-patient number, the demand for medical equipment is also rising [6]. However, the large number of medical equipment in hospitals carries issues related to productivity, security, safety and maintainability [4]. Problems that often occur include medical equipment that are not well maintained, missing and underutilized [7]. The unavailability of medical equipment can result in patients unable to receive effective treatment and endanger the patient's health condition and life. The appropriate availability and placement of equipment in hospitals not only improves the quality

of patient treatment but also influences the outcomes of treatment in emergency situations [11]. Therefore, asset management could be considered an exceedingly important task that should not be neglected by hospitals in order to make sure that medical equipment and other inventory owned by hospitals are effectively utilized [10].

Asset management is the process of organizing, planning, designing and controlling the acquisition, care, refurbishment, and disposal of infrastructure and engineering assets to support the delivery of services. It is a systematic, structured process covering the whole life of physical assets [2]. With the information obtained from recording asset data, the hospital will be able to know for sure what assets and how many assets are owned by the hospital, as well as its location and the total value of assets owned by the hospital. In Indonesia, the importance of asset management is emphasized through Permenkes 1189/Menkes/Per/VIII/2010 issued by the Ministry of Health for hospitals to guarantee safe, quality and useful medical devices and ensure that medical device products meet the requirements and according to established standards. Asset management is also created as an effort to support Indonesian hospital in fulfilling hospital accreditation (KARS), ISO 9001-2008 quality conformity or Joint Commission International (JCI) and Undang Undang Republik Indonesia No. 44 Tahun 2009 concerning hospitals which includes management of facilities, infrastructure and equipment in order to be well managed, effective and efficient.

In practice, there are several obstacles faced by hospitals in managing their assets, especially in terms of maintaining medical devices that require huge costs. Hospital asset budgeting, especially for medical devices, is very vulnerable to fraud because every year there will be assets budgeted to meet the needs of each unit in the hospital [5]. In order to help the hospital management to manage assets of medical equipment and non-tools medical treatment properly, effectively and efficiently, it is necessary for hospitals to have support in the form of application software, which is able to assist the hospital in managing assets. PT Nuansa Cerah Informasi (NCI), an Indonesian software developer company, which engages mainly in healthcare industry, see this opportunity to develop asset management system for healthcare as its new product.

This research first focuses on the design thinking approach as a method for producing information technology innovations that focus on "Human Centered Design". Design thinking has shown its potential to produce innovative, user-centered design concepts and is widely used by consultants such as IDEO. The right integration of the design thinking process can result in software development with creative ideas and product-market fit solutions.

In order to introduce the Design Thinking concepts into common IT development models, the Nordstrom model was chosen where it includes Lean Startup and Agile for developing new software products [3].



Fig. 1 the Nordstrom model [3].

Lean startup is a new approach of entrepreneurship that advocates building the product iteratively and deliver to the market for earlier feedback [8]. Applying Lean startup methodology helps established company to build the right product and to find the right market segment faster by wasting elimination and continuous flow [24]. This study aims to explore the pains and gains of Indonesian hospitals regarding asset management tasks and to propose a rapid new product development of asset management system for healthcare through Design Thinking and Lean Startup approaches.

II. METHODOLOGY

The research was conducted through qualitative approach as the occurred problem requires exploration based on the customer's point of view. Qualitative approach unlocks the opportunity to dive deeper to the thought and opinion of the respondent to get a better understanding through first-hand experience, truthful reporting, and quotations of actual conversations.

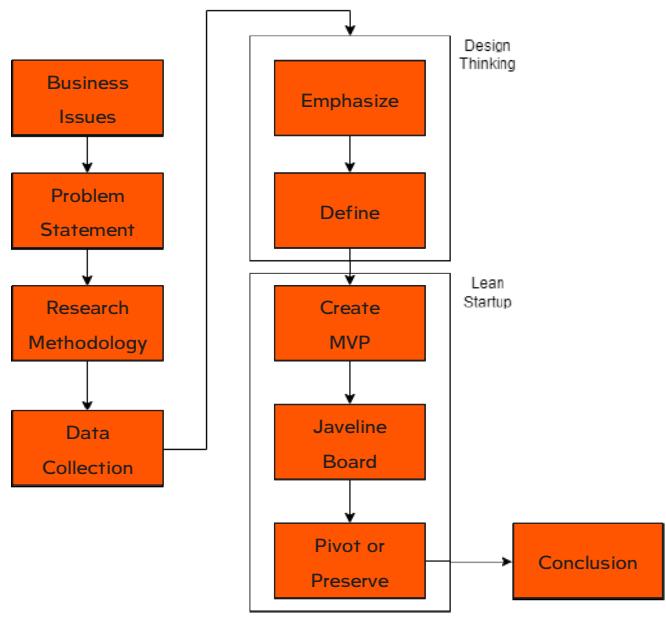


Fig. 2. Research framework.

The research starts with practices of Design Thinking to find out the needs of users, identify problems and propose solutions to be built in the next step. The Empathize stage of the Design Thinking process involves developing a sense of empathy towards the user who is going to be using the final product. FGDs were conducted with six Indonesian client hospitals of NCI separately with the total of 13 participants from various departments which correlated with asset management in the hospitals; Facilities and infrastructure department; Financial department; IT department.

After information gathered from the FGD, the second step of the design thinking process is Define. Define is about synthesizing the findings into powerful insights in order to bring clarity and focus to the design space. This step begins with analyzing the information gathered from the FGDs and understanding about the experience of the users. Then, synthesizing the analysis is done with the output of the list of features that are able to solve the problems faced by customers. The MVP Ideation is done through brainstorming that was followed by development team of PT NCI to see the problems from different perspectives in order to build the solution.

After the MVP is developed, the next step is to collect feedback from target customers. In this research, the mockup MVP is demonstrated through a short presentation to 10 participants from 6 different hospitals through online meetings where the functionality of each page was explained to obtain feedbacks.

III. RESULTS

A. Design Thinking

Based on the FGDs result there are several pain points of the existing asset management that respondents are currently facing in their daily tasks that is illustrated in Figure 3. The most extreme pain point is the inability to report accurate asset information that could impact the evaluation of hospital operations. Regional hospitals are responsible to report their assets list and valuation to the government as the asset procurement is funded by public tax, making their asset as part of regional property. Several regions in Indonesia have their own regulations to regulate the assessment of regional property and the procedures for their elimination. To control the regional property, at least once a year there will be audit that take place in regional hospital where asset information clarity is being checked. Misalignment of asset clarity will be taken seriously as it is vulnerable to fraud. The FGDs result generated four gains expressed by the respondents as shown in Figure 3. This is in accordance with a finding that there is a tendency that customers find it difficult to express their needs in a product accurately.



Fig 3 Customer profile

'Transparency of asset data' is categorized as the most essential. With the current practice of asset management in hospitals which utilize sheet form and Microsoft Excel to store asset information, it requires a lot of time and effort to access asset information when needed for reporting purposes.

To build the solution, Value Proposition Canvas is used to map steps that can be taken to make users complete their functional work through gain creators and pain relievers in product & service offered. To overcome the biggest pain, the MVP of the system will be equipped with a feature to generate reports easily. In providing the accurate asset information, an integrated database must be built as a library to gather real-time status of asset information. This integration will eliminate the pain of scattered asset data collection that is faced by current asset management

practice in hospitals by providing status updating access for different departments in the hospital that have intersections with assets. The system will be equipped with automatic preventive maintenance reminders as the pain reliever of unscheduled maintenance. This feature will also reduce the risk of asset breakdown which contributes to over budgeting. The last pain reliever for the MVP is asset location traceability which is expected to improve the problem of scattered assets.

The most essential customer gain based on the FGD result is the transparency of asset data. From the results of the brainstorming, there are three gain creators for the MVP idea. The first gain creator is remote accessibility, in which users are able to access asset information through multiple devices such as mobile phones or PC wirelessly through the web-based system. Not only limited to monitoring asset status, users will be able to update asset status and location through these devices. To fasten the process of asset identification, each asset will be equipped by QR code or RFID tags as identification code that will be quickly identified through scanning from mobile devices.



Fig 4 Value proposition

B. Lean Startup

From the identified points of pain relievers and gain creators based on Design Thinking process, a mock up minimum viable product (MVP) is built. In software development businesses, MVP can also be used to support the design process, bridge communication gaps and facilitate cost-saving activities [1]. In this research, a mockup MVP of asset management systems for healthcare facilities is developed to represent the functionality of the real system through user interface. Features within the mockup MVP are built based on the customer's highest pain and gain that are explained in the previous section

- Asset List Page: Page containing information on every asset owned by the Hospital such as Asset ID, Category, Brand, Amount, and Price.

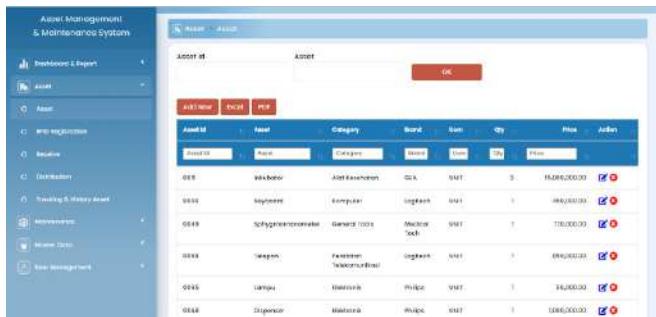


Fig 5. Asset list page

- b. Asset Report Page: Feature to generate reports automatically from the system in PDF or Excel format.

Fig 6. Asset report page

- c. Asset Information Page: Detailed information of each asset can be stored on this page such as Asset name, Asset ID, Brand, Price, UMDNS and other records.

Fig 7. Asset information page

- d. Asset Maintenance Information Page: Feature where users input maintenance requirements/asset calibration such as maintenance type and interval to the database. This feature generates an automated notification of asset maintenance reminders to responsible staff through email.

Fig 8. Asset maintenance information page

- e. Preventive Maintenance/Calibration Schedule Page: Page to show information on asset maintenance schedules, details of actions, and maintenance status whether it is carried out or not.

Fig 9. Preventive maintenance page

- f. Repair Schedule after Damage (Corrective Maintenance) Page: A page that allows maintenance staff to see what repairs need to be made in the future.

Fig 10. Corrective maintenance page

- g. Asset Dashboard Page: The main page contains a summary of hospital asset information starting from the asset value, value for each category, and the maintenance costs that have been spent.



Fig 11. Asset dashboard page

After conducting an MVP test through mockup presentations, there are 12 points of feedback from the customers that should be followed for the next stage of development. The feedbacks are then group to five aspects:

1. User interface: The system is expected to have a simple interface that focuses on what is contextually important, reducing text, and creating an instantly recognisable image.
2. Features: Some suggested features to be added range from 'Request of Maintenance', 'Asset Depreciation', and 'Generate Kemenkes Maintenance Form'.
3. Security & Accessibility: The hospital asset management system is desired to have a limitation of access for different departments within the hospital management to provide safer data security.
4. Language: Bahasa Indonesia is more preferable to be used in the system to reduce the misunderstanding from the language barrier.
5. Pricing: The final product price is expected to be not as expensive as hospital information system product.

IV. DISCUSSION

After conducting FGDs with six hospitals in Indonesia as the target customer, there are several pains and gains that are identified within the current practice of asset management in hospitals. The most extreme pain point is the inability to report accurate asset information. It was discovered during the FGD that every hospital, particularly regional hospitals, have an obligation to report the total asset value to the regional government at least once a year. All of the six hospitals participating in this research revealed that they have not provided accurate asset value due to the difficulty in managing hundreds to thousands of assets. The misaligning information could lead to the investigation of Badan Pemeriksaan Keuangan Republik Indonesia which will affect the hospital evaluation, accreditation, and reputation. Private hospitals

also have a responsibility to value their asset value to the shareholders. Based on the customer gains, the most desired gain is the transparency of asset data. In current practice, the asset information is not integrated and scattered in different departments in hospitals. Causing inefficiency of time and effort when specific asset information is needed.

V. CONCLUSION

This study explored the challenges faced in the current asset management practice in Indonesian hospital by applying the Nordstrom Model to IT development. This paper makes several contributions. First, it examines the pains and gains in Indonesian hospital asset management. The importance of asset management system in Indonesian hospital is accordance to the finding that the medical equipment maintenance service becomes a priority for the hospital managers to reduce the cost and the dependency on external parties while ensuring that the medical devices are safe, accurate, and operating at the required level of performance [9]. The second contribution is that using the Lean startup principles as the framework, we provide the basic product-market fit example guideline for future development of asset management system for healthcare industry. The successful use of mock up MVP in this study supports finding that MVP bridges communication gaps between entrepreneurs, developers, customers and facilitate the cost-saving activities in software development [1].

We envision a future study which will investigate in-depth the next iterations of Agile development of this system. Moreover, a comparative study on the companies that have used Lean startup and conventional software development is put into the next agenda.

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Paper 70

Relationship Among Online Learning, Digital Competencies, And Digital Organizational Culture Towards Generation Z Individual Performance During Hybrid Internship Activity, Study Case: MBKM Internship

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ICMEM

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Abstract - In Digitalized era, the pandemic of Covid-19 is requiring a huge transformation on how employees work inside a company. List of employees includes the Interns of Generation Z which are newcomers to the labor market. The Hybrid Internship is becoming an event to adapt to the pandemic conditions. Furthermore, along with the digital industry being developed worldwide it requires deeper understanding of factors that become a variable for Generation Z Individual Performance. There is still a lack of Journal of research that conducts research mainly focused on Generation Z with several variables related with the growing digitized industry. This opportunity became an ideal condition for testing several variables that related with the Generation Z Individual Performance. This research uses Quantitative approach with the Multiple Regression Analysis to measure relationships among variables and Qualitative approach by Interview to get insight from the industry. Research findings showed there is a positive and significance relationship among Digital Competencies and Digital Organizational Culture towards the Generation Z Individual Performance and also there is no relationship between Online Learning towards Generation Z Individual Performance.

Keywords - Digital Competencies, Digital Organizational Culture, Generation Z, Individual Performance, Online Learning

I. INTRODUCTION

Individual Performance can be considered a personal achievement after spending time and energy on each assignment related to achieving the work objective while building relationships with other employees [1]. Individual Performance in a general overview consists of several aspects that interrelate one another for maximizing the Individual Performance. On daily usage or implementation those aspects are useful to make sure that the company or the organization where the individual went to fulfill the need of the employee to help them reach their highest potential performance. This condition is important because Individual Performance is one of the essential components that can predict organizational or business performance. One of the examples that can be seen from a mature company is that usually Individual Performance and Organizational performance should be aligned so it will be easier for the company to decide for the company [2].

Generation Z, among the other generations that filled the labor market, has the tiniest information for the company to know the factor that influences conditions inside the working environment. This happened because the first batch of Generation Z entered the labor market simultaneously as the Pandemic of Covid 19 hit worldwide. The condition makes the way to understand their working condition characteristics still less known. Generation Z has a different personality compared with other previous generations because of the dynamic condition of birth year. The difference between generation Z characteristics in the working environment is the tendency to use digital technology as a tool and have a high tendency for mood swings during daily conduct and the Generation Z also have the tendency to rely on their technology to get the information, they need [3]. The differences shown by generation Z make it quite essential for a company to have a deeper understanding of the factor that could affect the generation Z with a kind of activity that can be given a hint or an overview on how Generation Z performance in an actual working condition

The government of Indonesia, mainly the Directorate General of Higher Education, Ministry of Education, Culture, Research, and Technology, considers the importance of internship activity for a generation Z that will soon have a significant share inside the labor market in five years. Based on the consideration itself, the Ministry of Education is introducing the Merdeka Belajar Kampus Merdeka (MBKM) program. MBKM is an official program from the Ministry of Education that has several programs to facilitate the University students to develop their soft and hard skills. One program included on the MBKM is that the Certificated Internship was conducted between 3 - 6 months [4]. The MBKM internship itself cooperates with many national or local companies that fulfill the requirements set by the Ministry of Education. This program gives a chance for university students to have an internship experience while having the chance to convert the internship activity into Academic Credits at the university [4]. This chance makes the activity itself attract the university student's attention because it is a possible chance for them to get the relationship and experience on their targeted companies.

The chance offered by the MBKM internship is attracting student attention, and now around 15.000 students are joined inside the MBKM Internship activity that spread all across the country, both online and offline working [4].

The internship participant will work for a semester with a maximum conversion of academic credits is 20 SKS each semester. Government subsidies bear the cost of participation and the living cost. Moreover, Participants of the Internship will be faced with an actual project and will be led by a mentor from the hosting company.

The MBKM internship sure did give students the opportunity to get their potential experience to prepare themselves. However, the problem inside the internship activity itself is because of the pandemic condition and the learning style being received by the students before the Ministry of Education announced this MBKM program. The issue for University students, which is also a generation Z, is that they feel that online learning and the pandemic condition are affecting their capability to get the maximal knowledge from college because University student feel that presence on learning are essential to get the maximal knowledge and online learning do not give the presence feeling [5]. They should deal with themselves to make them able to give a high level of performance output. This condition also needs to be understood by the hosting internship company because it can be a valuable insight for them to understand what to do to facilitate and maximize the performance from Generation Z.

The other problem is that there is a research gap related to the availability of previous research that is able to give an overview about factors that has a positive and significant relationship towards the Generation Z individual performance which is still lacking. Based on the preliminary research that is being conducted towards the current MBKM Internship employer there are several factors that are being mentioned by them. Factors being mentioned by the internship employees are Digital Technology Competencies, Organizational Culture, and Online Learning. The factors mentioned above are becoming the factor that later on will be researched in this paper to know the relationship among each factor towards the Individual Performance. MBKM internship can be a suitable study case to get an insight from research about the Factors that has a positive and significant relationship towards Generation Z performance since it is based on an actual project and a hands-on experience from a Generation Z point of view. This is important because if the company fails to understand the factors and how to handle them, it could be a potential loss when Generation Z has a higher labor market share.

Research Objective

1. Analyzing relationships between Online Learning and Individual Performance
2. Analyzing relationships between Digital Competencies and Individual Performance
3. Analyzing relationships between Digital Organizational Culture and Individual Performance

Research Question

1. Are there any positive and significant relationships between Online Learning and Individual Performance?
2. Are there any positive and significant relationships between Digital Competencies and Individual Performance?
3. Are there any positive and significant relationships between Digital Organizational Culture and Individual Performance?

Scope of Limitation

The Limitation of the research is a factor that having a positive and significant towards the performance of generation z employees in the context of MBKM Internship. The Research Method being utilized will be a Quantitative and Qualitative approach. The respondent itself is limited to university students that are involved in MBKM Internship which are being focused mainly but not limited to generation z university student in the Island of Java. The outcome of this research may not fit to be applied in other cultures or countries so further research is needed throughout this research. This research will be conducted during the 2021/2022 academic year. The Data Collection Timeline will be conducted during June - July of 2022 using the method of the questionnaire to ask the respondents. This research also unable to fairly distributed the respondent distribution to represented each specific region in Indonesia. This research also does not specifically mention and analyze the universities origin of each of the respondents. This research also does not specifically mention industries for the internship company.

Generation Z

Generation Z are a generation that was born from 1997 until 2005 that are currently in the preparation stage and early stage of entering the labor market [6]. Generation Z can be considered as a generation inside the labor market that are having a much bigger involvement in their work not just based on their skills and knowledge but also their comfortness regarding the condition and situation in the working environment [3]. The Generation Z itself are known as the digital technology generation because since they were born, they extensively connected and used computers and digital technologies and also, they have a massive tendency to work as an individual rather than teamwork to make sure they can achieve their designated environment that they want [3].

Individual Performance

Based on the preliminary research there are several factors that influence Individual performance. This preliminary research was conducted by doing interviews with several students that took the MBKM Internship and they mention that factors that influence their Individual performance are Digital Competencies, Online learning, and the Digital Organizational Culture where they went for an internship. Those statements are being strengthened by several journal articles which According to [7] Online learning has a positive effect on employee performance. Another journal article reveals that digital competencies have a positive impact on employee performance as being explained in [8], and also another journal article mentioned that Culture has considerable influence on employee performance as mentioned in the research by [9]. All of those variables based on several journal articles that are already being published are affecting the level of employee performance. In this research it will focus on analyzing those variables whether it has a positive and significant relationship towards the Generation Z Individual Performance.

Online Learning

Based on the previous study showed that the level of online learning being implemented inside organization are having a significant relationship with an individual performance [10]. Beside that in another journal show that in the term of Online Learning for University student having a significant result regarding the higher level of an online learning can lead to a positive result for student competencies performance [11]. With several previous study results above it showed that capability of employees that have a high level of online learning are essential when an organization aims at the potential maximum output of each employee individually. Because of the previous findings the hypothesis to determine the correlation between Online Learning and the Individual Performance for Generation Z in MBKM Internship is

H1: Online Learning has a positive and significant relationships towards the Individual Performance

Digital Competencies

Based on the preliminary research that was conducted toward several internship staff found that they feel digital competence that is related with the usage of IT and computerized software are influencing their work performance. The competence that consists of Knowledge, Skills, and Attitude are essential to be mastered by an individual. Competence has the positive and significant relationship with the Individual performance [12]. Furthermore, Digital Technology Competence or in the

same understanding of the Digital competence also have a significant relationship with the Individual Performance [8]. Based on several studies that were mentioned above the hypothesis that will be carried out is

H2: Digital Competencies has a positive and significant relationship towards the Individual Performance

Digital Organizational Culture

Digital Organizational Culture is the most important thing to be settled to make sure that the employees have the chance to fully develop themselves and be able to contribute very well to the company productivity and performance by giving them the positive type of culture that offer them ability to adapt to the digitalized era [13]. Based on a traditional Organizational Culture have a positive and significant relationship towards an Individual Performance [14]. Based on several journal articles already published the hypothesis that can be developed to be tested in the research will be

H3: Digital Organizational Culture has a positive and significant relationship towards the Individual Performance

Conceptual Framework

There is a theoretical framework that is being proposed in this research based on several variable explanation above that can be seen below [Figure 1].

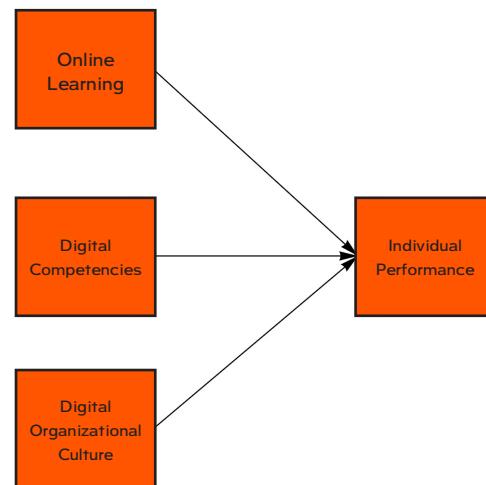


Figure 1. Conceptual Framework

II. METHODOLOGY

The Methodology being implemented to gathering, analyzing and interpreting the data for measuring the relation among each variable towards the Individual Performance in which according to the literature review consist of Digital Competencies, Online Learning and the Digital Organization Culture will be Qualitative and

Quantitative methods using questionnaires that are distributed to Generation Z employees that ever or currently taking the MBKM Internship and Unstructured interview toward Generation Z to dig preliminary information from the Generation Z that already took the MBKM Internship.

Questionnaire will be conducted by using the question list based on several previous research to test each of the hypotheses toward the individual performance. Furthermore, the questionnaire will be divided into two parts in which first part will focus on the demographic information of the respondent and the second part will focus on the respondent's perspective regarding each of the variables using a 5 Likert scale question. This questionnaire was being distributed using an online form using google form to get the respondent's answer. The Interview will conduct to get insight regarding the current reality situation in the company by interviewing several Generation Z internship employees.

Sampling technique being used will be Random sampling methods. Respondents of the research will be Generation Z University student that already took or currently taking MBKM Internship. The student that met the criteria of respondent in total is 358 Respondents. This criterion was based on Their experience on taking an Online learning and also taking the MBKM Internship.

III. RESULTS

Validity and Reliability

Table 1 - QUESTIONNAIRE VALIDITY

Online Learning			
Instrument	r count	r table	Result
OL1	0.337	0.103	Valid
OL2	0.572	0.103	Valid
OL3	0.704	0.103	Valid
OL4	0.75	0.103	Valid
OL5	0.736	0.103	Valid
OL6	0.664	0.103	Valid
OL7	0.672	0.103	Valid
OL8	0.671	0.103	Valid
OL9	0.682	0.103	Valid
OL10	0.708	0.103	Valid
OL11	0.708	0.103	Valid
OL12	0.589	0.103	Valid
OL13	0.568	0.103	Valid

Digital Competencies			
Instrument	r count	r table	Result
DC1	0.664	0.103	Valid
DC2	0.63	0.103	Valid
DC3	0.537	0.103	Valid
DC4	0.619	0.103	Valid
DC5	0.655	0.103	Valid
DC6	0.546	0.103	Valid
DC7	0.601	0.103	Valid
DC8	0.664	0.103	Valid
DC9	0.655	0.103	Valid
DC10	0.638	0.103	Valid
DC11	0.537	0.103	Valid
DC12	0.535	0.103	Valid
DC13	0.635	0.103	Valid
DC14	0.513	0.103	Valid
Digital Organizational Culture			
Instrument	r count	r table	Result
DOC1	0.689	0.103	Valid
DOC2	0.707	0.103	Valid
DCO3	0.713	0.103	Valid
DOC4	0.676	0.103	Valid
DOC5	0.743	0.103	Valid
DOC6	0.738	0.103	Valid
DOC7	0.712	0.103	Valid
DOC8	0.722	0.103	Valid
DOC9	0.696	0.103	Valid
DOC10	0.749	0.103	Valid
DOC11	0.729	0.103	Valid
DOC12	0.692	0.103	Valid
Individual Performance			
Instrument	r count	r table	Result
IP1	0.685	0.103	Valid
IP2	0.604	0.103	Valid
IP3	0.686	0.103	Valid
IP4	0.664	0.103	Valid
IP5	0.717	0.103	Valid
IP6	0.638	0.103	Valid
IP7	0.675	0.103	Valid
IP8	0.572	0.103	Valid
IP9	0.706	0.103	Valid

Table 2 - Questionnaire Reliability

No	Variables	Cronbach's Alpha	N of Items
1	Online Learning	0.885	13
2	Digital Competencies	0.859	14
3	Digital Organizational Culture	0.912	12
4	Individual Performance	0.837	9

Based on the Validity and Reliability test in the table above (Table 1) and (Table 2) it can be seen that all of the 48 question instruments being ask towards respondent showed that all of the question instrument are valid and also reliable based on the result that show all of the r count are greater than the r table and also the Cronbach's alpha result showing greater than 0.6. this instrument used during the research to determine the hypothesis testing result. The test also being conducted which is to check the Classical assumption test was conducted and the result show that the regression model used in this research are not showing violation in Heteroscedasticity, Normality, and Multicollinearity.

Multiple Linear Regression

The Regression model will consist of 2 model. First model will only measure the relationship among core independent variables towards dependent variables. Second model will also measure core independent variables with an additional control variable toward dependent variable.

Table 3 - REGRESSION MODEL 1

Coefficients ^a					
Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	11.637	1.673	6.955	0.000
	Digital Competencies	0.253	0.035	7.220	0.000
	Online Learning	0.023	0.022	1.061	0.289
	Digital Organizational Culture	0.219	0.032	6.771	0.000
a) Dependent Variable: Individual Performance b) Standards errors in parentheses; *p<0.10, **p<0.05, ***p<0.01					

Based on the analysis result regression model 1 that implemented in the research will be

$$Y = 11.637 + 0.023 X_1 + 0.253 X_2 + 0.219 X_3$$

Description:

Y= Dependent Variables (Individual Performance)

X1= Interdependent Variable (Online Learning)

X2= Interdependent Variable (Digital Competencies)

X3= Interdependent Variable (Digital Organizational Culture)

Based on the second calculation result it can be seen that

Table 4 - REGRESSION MODEL 2

Coefficients ^a					
Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	11.542	2.538	4.548	0.000
	Digital Competencies	0.264	0.036	7.420	0.000
	Online Learning	0.022	0.022	1.000	0.318
	Digital Organizational Culture	0.218	0.033	6.603	0.000
	Female	0.492	0.359	1.371	0.171
	Age	-0.019	0.091	-0.208	0.835
	Internship Duration	-0.009	0.085	-0.103	0.918
	Online Learning Duration	-0.028	0.020	-1.422	0.156
a) Dependent Variable: Individual Performance b) Standards errors in parentheses; *p<0.10, **p<0.05, ***p<0.01					

based on the table above the second regression model for this research is:

$$Y = 11.542 + 0.022X_1 + 0.264 X_2 + 0.218X_3 + 0.492X_4 - 0.019X_5 - 0.009X_6 - 0.028X_7$$

Description:

Y= Dependent Variables (Individual Performance)

X1= Interdependent Variable (Online Learning)
 X2= Interdependent Variable (Digital Competencies)
 X3= Interdependent Variable (Digital Organizational Culture)
 X4= Female
 X5= Age
 X6= Internship Duration
 X7= Online Learning Duration

Based on the regression result of both regression model 1 and regression model 2 it can be seen that for the relationship among the main core independent variables towards the dependent variables the significance value is showing the same result of significance relationship result. Based on the findings it means that the regression model that being utilized in this research can be considered as a Robust model. Furthermore, there is no significance relationship among control variables towards the dependent variables.

Table 5 - MODEL SUMMARY

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670 ^a	0.449	0.444	3.157
2	.675 ^a	0.455	0.444	3.158

Based on the summary of the regression model it can be seen that the relationship between the Independent Variables X and the dependent variable Y in the first model can be defined as the independent variables has 44.9% relationship towards the Dependent variable. Furthermore, from the second regression model it can be seen that the value of R square is increasing means that with additional Variable the relationship between independent variables and the dependent variable can be defined as the independent variables has 45.5% relationship towards dependent variable.

Hypothesis Testing & T test

Table 6 - Hypothesis Testing and T Testing

		Coefficients ^a			
		Model 1		Model 2	
Model	t	Sig.	t	Sig.	
1	(Constant)	6.955	0.000	4.548	0.000
	Digital Competencies	7.220	0.000	7.420	0.000
	Online Learning	1.061	0.289	1.000	0.318
	Digital Organizational Culture	6.771	0.000	6.603	0.000
	Female			1.371	0.171
	Age			-0.208	0.835
	Internship Duration			-0.103	0.918
	Online Learning Duration			-1.422	0.156

a) Dependent Variable: Individual Performance
 b) Standards errors in parentheses; * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Based on the table result above we can draw conclusion regarding each of the hypothesis of the research:

- o H1: Online Learning has a positive and significant relationships towards the Individual Performance. H1 is Rejected, the significance value of the variable Online Learning is 0.318 which is greater than 0.05 and the t-count (1.000) < t-table (1.966). This show that there is no relationship between Online Learning and Individual Performance.
- o H2: Digital Competencies has a positive and significant relationship towards the Individual Performance. H2 is accepted, the significance value of the variable Digital Competencies is 0.000 which is less than 0.05 and the t-count (7.420) > t-table (1.966). This finding showed that there is a positive and significance relationship between Digital Competencies and Individual Performance.
- o H3: Digital Organizational Culture has a positive and significant relationship towards the Individual Performance. H3 is accepted, the significance value of the variable Digital Organizational Culture is 0.000 which is less than 0.05 and the t-count (6.603) > t-table (1.966). This finding showed that there is a positive and significance relationship between Digital Organizational Culture and Individual Performance.

Summary From the Hypothesis testing can be seen in the table below (Table 2)

Table 7 - HYPOTHESIS TESTING RESULT

Variable	Hypothesis Result
Online Learning	Rejected
Digital Competencies	Accepted
Digital Organizational Culture	Accepted

From the regression result it can be seen that the variables that being accepted and have a positive and significant relationship towards dependent variables is Digital Competencies and Digital Organizational Culture. Furthermore, the variables that being rejected and do not have relationship with dependent variable is Online Learning.

F Test

Table 8 - F TEST TABLE MODEL 1

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	F
1	Regression	2875.519	3	958.506	96.177
	Residual	3528.001	354	9.966	
	Total	6403.520	357		

a. Dependent Variable: Individual Performance

b. Predictors: (Constant), Digital Organizational Culture, Online Learning, Digital Competencies

Based on the F testing result in the table above it can be seen that for the first model it can be seen that independent variables have a significance simultaneously relationship towards the dependent variables based on the significance value 0.00 less than 0.05 and the F count (96.177) > F table (2.13)

Table 9 - F TEST TABLE MODEL 2

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	F
1	Regression	2913.320	7	416.189	41.736
	Residual	3490.200	350	9.972	
	Total	6403.520	357		

a. Dependent Variable: Individual Performance

b. Predictors: (Constant), Online Learning Duration, Online Learning, Female, Age, Internship Duration, Digital Organizational Culture, Digital Competencies

Based on the F test result table above it can be seen that for the second model the independent variables have a significance simultaneously relationship towards the dependent variable based on the significance value of 0.00 less than (<) 0.05 and the F count (41.736) greater than (>) F table (2.03).

IV. DISCUSSION

Relationship Between Online Learning and Individual Performance

Based on the statistical hypothesis testing it was found that Online learning did not have relationship towards the Individual Performance. Reasoning of the findings is that the significance value of the Online Learning showed 0.318 or can be recognized does not have relationship towards the Individual Performance and based on t-count it showed t-count (1.000) < t-table (1.966). So based on the result itself it can be define as even though the respondent improved or decrease their online learning experience it will not improve their Individual performance. Furthermore, this relationship between Online Learning and Individual Performance is not aligned with several findings in previous research. Based on several previous journal regarding the Individual Performance showed that a higher level of Online learning is having significant and positive relationship toward an Individual performance [10]. and Higher level of Online Learning for having a positive and significant result for student to excel in their Individual Performance [11]. However, several factor that could be considered in the real condition in Indonesia that can become the factors that make respondent opinion feel that the Online Learning are not essential to improved their Individual Performance is Quality of Online Learning, the facilities that facilitate the Online Learning process, and also the accuracy of material that being taught are not align with the business industry needed. This several factors should be improved further in Indonesia particularly because theoretically Online Learning should have a significant role for Individual Performance because it enhanced the Individual capabilities to perform better.

Relationship Between Digital Competencies and Individual Performance

Based on the statistical hypothesis testing it was found that Digital Competencies have a positive and significant relationship towards the Individual Performance. Reasoning on the findings is that the significance value of the Digital Competencies showed 0.000 which is less than 0.05 and based on t-count it showed t-count (7.420) > t-table (1.966). This finding showed that there is a positive and significance relationship between Digital Competencies and Individual Performance. Based on the testing result It can be defined as the higher digital competencies owned

by the Generation Z Internship employees the higher Individual Performance outcome they have. This finding is aligned with several previous journal that already being published which mentioned that Digital Competencies having significant and positive relationship towards the Individual Performance based on the research that being conducted by [8] and [12]. In reality this condition was also being confirmed by Generation Z that took the Internship activity that in this developing digitized world it is necessary to have sufficient digital competencies to be able to survive in the business industry.

Relationship Between Digital Organizational Culture and Individual Performance

Based on the statistical hypothesis testing it was found that the Digital Organizational Culture have a positive and significant relationship towards the Individual Performance. Reasoning on the findings is that the significance value of the variable Digital Organizational Culture is 0.000 which is less than 0.05 and the t-count (6.603) > t-table (1.966). This finding showed that there is a positive and significance relationship between Digital Organizational Culture and Individual Performance. Based on the testing result it can be defined as the higher Digital Organizational Culture that being implemented by the Organization it can improve the Individual Performance of Generation Z Internship Employee. This finding aligned with previous journal that already published which stated that there are a positive and significance relationship of Digital Organizational Culture towards the Employee Performance Improvement inside an organization [13]. Furthermore, it is being studied on the traditional organizational culture in which Culture have a positive and significant relationship toward employee performance [15].

V. CONCLUSION

Based on the respondent result analysis using the Multiple Linear Regression there are some available conclusions that can be made including the recommendation for each of stakeholder.

This research was aimed to analyze the relationship among Online learning, Digital Competencies, and Digital Organizational Culture towards the Individual Performance of Generation Z Internship Employee in the study case of MBKM Internship. Based on the analysis result:

- o There is no relationship between Online Learning toward an Individual Performance
- o There is positive and significance relationship between Digital Competencies toward an Individual Performance

- o There is positive and significance relationship between Digital Organizational Culture toward an Individual Performance

From the Online Learning variable, it has no relationship towards an Individual Performance. It means that however the outcome level of Online Learning for each individual it will not affect their Individual Performance in their workplace. This variable usually influenced by factor such as facilities, educator and other factor that influence the Online Learning experience for each individual. This Variable was probable to did not have a relationship towards an Individual performance because those several factors were explained that differs among each Individual understanding in the Online Learning that leads into a different level of outcome that can be retrieved from each Individual regarding their performance in the workplace [16].

From the Digital Competencies variable, it has the highest positive and significant relationship toward Individual Performance. It means that the higher the level of Digital Competencies owned by an individual it will affect positively toward Individual Performance output of an Individual in their workplace. This was supported by other research that showed if an Individual Have a High level of Digital Technology Understanding it can affect their Performance to become much better while doing their working performance [17].

From the Digital Organizational Culture variable, it has the second highest positive and significant relationship toward Individual Performance. It means that the higher the level of Digital Organizational Culture experienced of an Individual inside a company it will affect positively toward their Individual Performance output in their workplace. This result was being supported by another research that already being conducted that showed that the Digital Organizational Culture of a company are having a positive relationship to boost the Individual performance inside the company [18].

Recommendation

Recommendation for future research

1. Increase the number of respondents not just limited to generation z that took the MBKM Internship. This recommendation aimed to future researcher to develop the respondent on more general generation z to make a much broader analysis of the generation z and factors that affect their individual performance during the present or future industry.
2. Expand the respondent demographic equally across the country of Indonesia. This recommendation aimed to expand the origin of the respondent to a much more

fairly distributed area across Indonesia.

3. Test additional variables that aligned with the future of digitalized industry. This recommendation aimed to improved and developed other variables that might suitable to be researched following the development of business industries.
4. Continue the research and improving the demographic distribution on specific industries. This recommendation aimed to future researchers to conduct a detailed researched on specific industries to get an academic view regarding the differentiation on each of the business industries.

Recommendation for Company

1. Improve the Online Learning Development activity not just limited to permanent employees. This recommendation aimed to give company consideration regarding the efficiency and the effectiveness of Online Learning to be established well to be able to meet the expectations of employees mainly for Generation Z that known as tech savvy generation and will react sensitively for Online Learning that utilized a digital technology.
2. Improve the Digital Organizational Culture inside the company culture to be able to adapt with the future industries. This recommendation aimed to improve the implementation and the development of Digital Organizational Culture inside a company to enhance the shifting towards a more agile culture in this current digitized era.
3. Develop the digital competencies capability of the employees to boost their individual performance. This recommendation aimed to giving a consideration towards the company to be able to facilitate their employee with a sufficient knowledge and skill on their digital competencies to be able to adapt and compete towards the developing digitized industry.

Recommendation for Universities

1. Improve the facilities of Online Learning in the Future to improve the Online Learning activities. This recommendation aimed to giving a consideration for Universities in Indonesia to improve their online learning facility to improve the Online Learning experience for universities students.
2. Improve the syllabus to match the industrial needs in the present and future condition. This recommendation aimed to make a suggestion for universities to develop a more specific syllabus that adapting the current developing business industries to give insight for student regarding the professional world.

3. Improve the digital competencies lesson for generation Z student to help them adapt with the present industries requirement. This recommendation aimed to develop a digital competency even further during the academic activity to give a futuristic insight of the digitalized era.

Recommendation for Generation Z University Students

1. Improve the Digital awareness regarding the developing technology. This recommendation aimed to encourage Generation Z to explore the digital technology development to be mastered in the future.
2. Encourage Generation Z to take part on giving suggestion to another stakeholder regarding the most comfortable online learning activity to be implemented in the future.

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Paper 71

Develop A Hybrid Recommendation System to Optimize Knowledge Utilization: A Case Study of an Indonesia Telecommunication Company

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ICMEM

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Abstract - With rapid industrial digitalization, companies need to strengthen core competences and digital talents within organizations to achieve competitive advantage. Companies have been developing digital knowledge management practices for acquisition, inventory, transfer, etc. But, to achieve a successful knowledge diffusion, increasing knowledge stock alone isn't enough. As the knowledge stock increases, user choice for learning is also increasing. Reliable recommendation system is required as the selecting knowledge to learn in repository grows more complex. Ideal competences for each position need to be addressed as the company has done assessment for their ideal workforce. Meanwhile, every knowledge user has their own preferences which can be seen from registered preferences and learning history. Hybrid recommendation approaches from content based filtering and collaborative filtering can be utilized to address these issues. Finally, to complete this study of knowledge utilization optimization using machine learning, we will use knowledge stock, and human capital development data from Telkom Indonesia to develop a more personal and efficient knowledge platform. The proposed model can be used as a basis for further development of knowledge management platforms.

Keywords - Knowledge Management; Knowledge Utilization; Recommender System; Machine Learning;

I. INTRODUCTION

A. Background

Digital industry is growing fast and competition has become fiercer than before. Companies have to face new challenges and adapt to survive in the industry. Indonesia Ministry of Communication and Information Technology in 2021 stated that in the next 15 years, Indonesia needs 600,000 new digital talents each year. Nair [9] stated that at least 50% of companies are experiencing a significant gap of digital talent, and 60% of them have difficulties to compete. Because of these issues, companies need to strengthen their competencies, especially related to digital talent.

To strengthen core competencies, aside from digitalization of business processes, companies need to rely on knowledge management and integration, and use information technology to assist company's knowledge

activities [7]. Growth of knowledge stock is also important to increase knowledge diffusion capacity and increase innovation performance. With these concerns, companies need to strengthen their knowledge stock from both quality and quantity perspective [15]. PT XYZ, the biggest telecommunication company in Indonesia, has been developing a digital knowledge management system (KMS) for years. In the last 3 years, knowledge utilization is declining significantly. Company is concerned with this issue as knowledge platform utilization is an important indicator of knowledge management implementation.

Platform Utilization

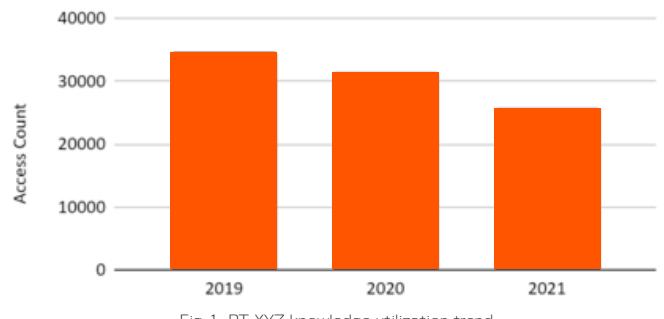


Fig. 1. PT XYZ knowledge utilization trend

PT XYZ is trying to address declining knowledge utilization issues by developing a new knowledge platform which accommodates multimedia knowledge such as text articles, videos, audios, and courses as a repository. Platform which adopts a social media system like this can improve knowledge utilization by covering informal knowledge formats [10]. This change is deployed to accommodate information technology and knowledge gaps with recommendations at the right time, right person and right format. This approach is expected to increase employee participation and result in higher knowledge utilization.

The following section discusses how to propose to build an efficient KM. The objective of this research is to develop a conceptual model of a knowledge recommendation system that can accommodate company and knowledge user needs of knowledge. This approach is expected to increase the company's knowledge utilization, as PT XYZ has set a target of 10% increase this year. This also aligns with the agenda of the Indonesian government to build digital talent for digital industry acceleration.

B. Literature Review

Generally, knowledge management (KM) can be described as defined as performing the activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance the impact of knowledge on goal achievement in organizations [3]. As the time goes, management perspective has shifted from scientific management invented by Frederick W. Taylor to knowledge economy and knowledge management. These changes affect companies' perspective of employees from "economic man" to "intellectual man" as represented by Peter Drucker [2].

Chen [2] explains that innovation area for knowledge management should be based on 3 areas: the first is emphasize emotional interaction to develop knowledge creation model further, the second is emphasize digital drive, and use advanced digital technology including network technology, to create an efficient knowledge management, the third is to sublimate the pursuit of philosophy from objective pursuit to subjective pursuit, the pursuit of meaning, the pursuit of value, and the pursuit of happiness. Align with focus on KM innovation areas, Wu [14] in their research on Chinese companies divided into 3 development phases; KM 1.0, KM 2.0, and KM 3.0. Table 1 explains the characteristics of each phase and their focus of function.

Table 1 - THREE GENERATION OF KNOWLEDGE MANAGEMENT

	KM 1.0	KM 2.0	KM 3.0
Practice Mode	<i>Capitalization</i>	<i>Contextualization</i>	<i>Intellectualization</i>
Characteristics	Knowledge management within the organizations	Global knowledge transferring	Artificial intelligence (AI)-enabled knowledge management
Research Focus	Knowledge creation, sharing, and storage process within organizations	Improve the efficiency of global knowledge transfer and cooperation through information technologies	Deep mining and micro mechanisms of the knowledge creation process driven by AI

PT XYZ has been developing its ideal Knowledge Management. Figure 2 explains the PT XYZ framework of KM. Emphasize digital drive and advanced digital technology are deployed to support the KM process. The main technology is a knowledge platform which can accommodate various formats. Wang et al. [13] explains how AI-enabled KM can increase utilization of knowledge and become the focus of KM research in the future. AI can assist knowledge acquisition, control knowledge activities, and identify potential needs that can't be accommodated by traditional KM. As companies shift their focus from how to efficiently manage and promote knowledge, to utilize big data and global knowledge to the company's benefit.

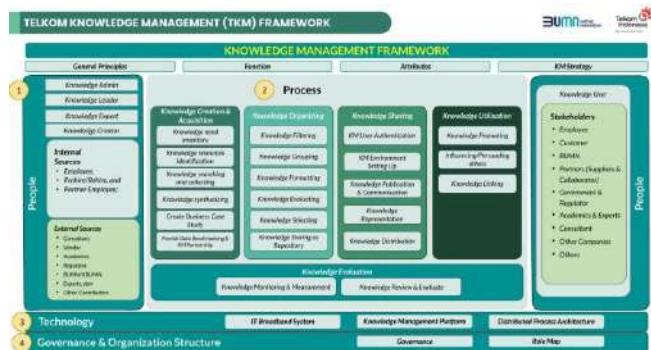


Fig. 2. Existing knowledge management framework

Knowledge stocks feature is regulated by human capital development at PT XYZ. Knowledge needs of the company are identified and listed in the competency's framework. Competencies divided into leadership and technical/professional competences with core values as their center. PT XYZ also has job architecture which is inseparable with competences framework and complement to each other development. These two frameworks give opportunity for the company to make further improvement on their business processes.

One of the future trends of AI-enabled KM stated by Wang et al [13] is designing personalized knowledge recommendation systems. In the past differentiated knowledge was hardly measured, now it can be measured with AI. Personalized recommendation systems can adjust knowledge recommendation based on data selection from user profile, navigation, history, and other online factors. Machine learning as an application of AI can analyze such data to predict the most fitting knowledge for users [4]. According to the PT XYZ case, we identified two main subjects who need to be measured: knowledge creator and knowledge user. With the main objective of knowledge-promoting, all knowledge processes will be included. There are 2 well-known recommendation system practices; the first is collaborative filtering is a method to give recommendations based on correlation between user and knowledge, in other word filtering knowledge based on other user's utilization or rating. The second is content based filtering, a method to classify similar knowledge considering user preferences, and then recommend different knowledge with same attributes [1].

These practices to build personalized knowledge recommendation is important to achieve efficient KM. Wang et al. [13] added that meeting individual needs alone isn't enough, management has to deal with organization level needs, such as organizational strategic goals. That said, multi-agent needs have to be considered. According to the PT XYZ case, there are two different agent perspectives; the first is a management plan to develop human capital, which is a top-down approach. The second is user history and pre-registered preferences which is a bottom-up approach.

II. METHODOLOGY

A. Machine Learning Development

In this research, we adopt machine learning development phases. There are 6 main phases of machine learning development identified by Maass & Storey [8]. Conceptual models should map business goals to data requirements. Data required is supplied by existing databases and data mining from business processes. This research focuses on developing conceptual models for understanding the problems and proposed solutions. The process of data collection and the following steps are excluded for further research after data mining technology for various formats is deployed.

First phase of machine learning is problem understanding. This phase includes problem statements and descriptions. Complex environment demands a manager to identify critical factors for decision making. Machine learning is applied to decision problems to develop better decision making. In the KM system, problems of declining knowledge utilization are identified. Knowledge utilization is described as the access count of knowledge documents uploaded to a knowledge platform by knowledge users.

Hypothesis is developed based on identified problems. Knowledge experts and managers examine existing conditions of the company to identify important factors involved. This hypothesis then is used as a problem statement.

Problem statement is then analyzed if it can be translated into a predictive model, and is feasible to be solved. During problem analysis, relevant documents are included. Competence directory and job architecture is analyzed as a company's perspective of talent development. Knowledge management playbook and knowledge platform reports are analyzed from a knowledge development perspective.

B. Conceptual Model

Johnson [6] defined conceptual model is the model of solution proposed that the researcher wants users to understand. A Model is developed by studying literature with the aim to create common understanding between the designer and users. Parush [11] added that conceptual models can be different based on the degrees of freedom given to the user in accomplishing tasks and achieving goals. Following this, typologies of conceptual models can be divided into two main categories: sequential and structured, nonsequential and unstructured.

In this phase, we develop a conceptual model based on solutions for problems stated and defined from the previous step. Conceptual models are developed based

on the existing framework of knowledge management and recommendation system development phases.

III. RESULTS

A. Problem Understandings

Knowledge utilization, represented by total count of knowledge platform access, is on a declining trend in the last 3 years. This is the main problem defined in knowledge management, and specifically the problem which this research is trying to address.

Management has described that accessing documents has become more difficult as the repository holds thousands of documents of knowledge. This hypothesis is supported by the fact that most of the documents in the repository are left unaccessed and also the existing classification is based on general categories, despite the competence's framework has been developed.

Solution for more efficient knowledge management, specifically knowledge platform is needed for this issue. PT XYZ has set a target to increase knowledge utilization by 10% at the end of 2022. An increasing trend is expected to happen in following years. Speaking of knowledge utilization, the company has developed a job architecture to classify its 23,756 employees into 3 job families, 12 job functions and 57 job roles. Competency framework is also developed to list competences needed by telecommunication companies, consisting of 2 types; leadership competencies and technical/professional competences. Competencies also act as complementary in supporting a job position for individuals to perform their work. Every job is expected to master 9-12 competencies which are prioritized based on business needs.

To conclude this problem understanding, we develop solutions based on the company's (top-down) and user (bottom-up) interests. Therefore, as stated in the knowledge management framework, we identified 3 components that should be involved; knowledge expert, knowledge user, and knowledge creator. Recommendation system with a machine learning approach will be developed to make better user experience when accessing knowledge platform. To accommodate multi-agent interests, a hybrid recommendation system is selected to combine collaborative filtering and content-based filtering.

B. Data Collection

Data collection will be conducted from various data sources. Data collection is based on data requirements to solve the problem. User profile, company's goal of competences development, knowledge data, and external references to build terms dataset.

Profile data to represent knowledge user interests, is collected from knowledge platform database and supported by other databases if needed. Data of competences accessed will be used for content-based filtering. Competence attributes of viewed documents are recorded and will be processed to match algorithm requirements. Media preferences for each user are represented by format attributes from access history. At last timestamp of access is recorded for adjustment of notification for follow up of recommendation calculation.

Knowledge experts create a competencies framework and assign ideal competences to each job role. This competency mapping data will be used for recommendation system, specifically collaborative filtering. Every employee is assigned to a job role. Ideal competences for each job role have different importance to each other, therefore weight is added as strength score. Data required from knowledge experts is a list of employees with a job role attribute and list of job roles with ideal competences as attribute and their weighted importance. At the time this research is conducted, knowledge experts are working on human capital data to assign job family, job function and job role attributes to employee data.

Knowledge creators play an important role to supply the fulfillment of knowledge stock. Data requirements for this representation will be collected from the knowledge repository. Knowledge stock of PT XYZ consists of many formats/media like; text article, video, and audio. Due to the complexity advanced data mining is required. Company needs to extract terms contained from various kinds of sources; plain text, audio to text, photos to text, and video to text. Unfortunately, PT XYZ is developing data mining technology for this use case and will be available in the near future.

Next step is data engineering, with the aim to decrease model complexity. We describe this process as pre-processing. Terms without any significant meaning to competences are removed, such as; like, to, from, with, etc.

C. Collaborative Filtering

Collaborative filtering is a recommendation system with an objective to give suggestions based on user correlation with knowledge. In this case knowledge is represented by competences. Company's goal is addressed in this recommendation system. Data of competencies mapping is used as score, and weight is added to enhance the priority.

Aside from the company's objective for competencies development, user objectives are accommodated. Knowledge platform has features to collect user preferred competences. These preferences can be aligned or

different from a company's mapping of a given job role.

We use model-based type algorithms because competences mapping and user preferences can be dynamic as the time goes. SVD is used for matrix factorization techniques to decrease dimension. Equation (1) explains SVD key function to decompose into three other matrices:

$$\mathbf{X} = \mathbf{U} \mathbf{x} \mathbf{S} \mathbf{x} \mathbf{V}^T \quad (1)$$

\mathbf{X} is $M \times N$ utility matrix; \mathbf{U} is a $M \times R$ matrix that shows relationship between user and competences as knowledge attributes. \mathbf{V} is a $R \times N$ that shows similarity of knowledge and competences included. and \mathbf{S} is a $R \times R$ matrix that shows the strength of each competence in knowledge. Each row of matrix represents a user, and each column represents knowledge.

D. Content Based Filtering

The aim of content-based filtering in KM is to classify knowledge based on their attributes. In this case attribute is competencies contained inside a knowledge document. The result is different recommendations of knowledge with similar competencies.

User needs of knowledge may vary for each individual. Historical data is recorded, in addition user favorite competences are pre-registered to enhance user data accuracy. This combination then is used as a user representation vector.

We use data mining on words for each knowledge document for the TF-IDF algorithm. Every word has weight added to determine its value to each competency. Weight in TF-IDF indicates how rare and significant each word is to a competency. Term TF (total frequency) is the frequency of a word appearing in a document. This means if the word frequently appears, the weight will be larger. Then we will add normalization for TF score using the length of the document. Equation of TF-IDF is described in equation (2) with $N(T_x, D_y)$ is the total count of a word x (T_x) in a document (D_y), where $N(P_y)$ is the count of all words.

$$TF(T_{xy}) = \frac{N(T_x, D_y)}{N(P_y)} \quad (2)$$

To address the different importance of each word in a competence, a weight for each word needs to be determined. IDF is using the scarcity rate of a word in the entire knowledge stock. Equation (3) explains IDF calculation where $N(D)$ is total count of documents in knowledge repository, and $N(D, T_x)$ is total count of documents contain the word x

$$IDF(T_x) = \log\left(\frac{N(D)}{N(D, T_x)}\right) \quad (3)$$

Therefore, the TF-IDF equation (4) will determine score for each word in each competences, with normalization:

$$TF - IDF(T_{xy}) = TF(T_x) \times \log_{10}\left(\frac{N(D)}{N(D, T_x)}\right) \quad (4)$$

User representation will be determined by historical data of media (format) of knowledge, and competences of documents accessed. These data will be weighted and calculated using for user competency rating. We obtained both representation of the user and knowledge with TF-IDF score for knowledge and rating score for user. Cosine similarity approach equation (5) is used to calculate the similarity of these representation vectors:

$$\cos = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\| \cdot \|\mathbf{B}\|} \quad (5)$$

For better understanding of this recommendation system, table 2 will serve as example of expected result of knowledge score of each document for this recommendation system:

Table 2 - EXAMPLE OF EXPECTED RESULTS

	Service Planning	User Support	Marketing Strategy
Document 1	0.015	0.030	0.097
Document 2	0.031	0.258	0.015
Document 3	0.174	0.075	0.059

E. Hybrid Recommendation System

Combination of two recommendation system methods is used to get advantages of both methods. Afoudi [1] explains there are 5 hybridization methods listed in table III. This research uses a weighted method, as top down and bottom-up approaches both are identically important.

Table 3 - KNOWN HYBRID RECOMMENDATION METHOD

Hybridization Method	Service Planning
Weighted	The scores of different recommendation systems combined together to produce a single recommendation.
Switching	Depending on current situation, the system switches between recommendation techniques.
Mixed	Recommendation from several different recommenders are presented at the same time
Cascade	One recommender refines the recommendations given by another.
Feature Augmentation	Output from one technique is used as an input feature to another.

F. Conceptual Model

We developed a conceptual model in a swim lane diagram for the proposed solution to solve the knowledge utilization problem. Conceptual model starts from 3 components identified from the company's knowledge management framework. Development process is divided into 7 lanes. First lane is the knowledge workers component involved. Second lane is data sources related to knowledge workers for data collection purposes. Third lane contains data pre-processing for each data collected.

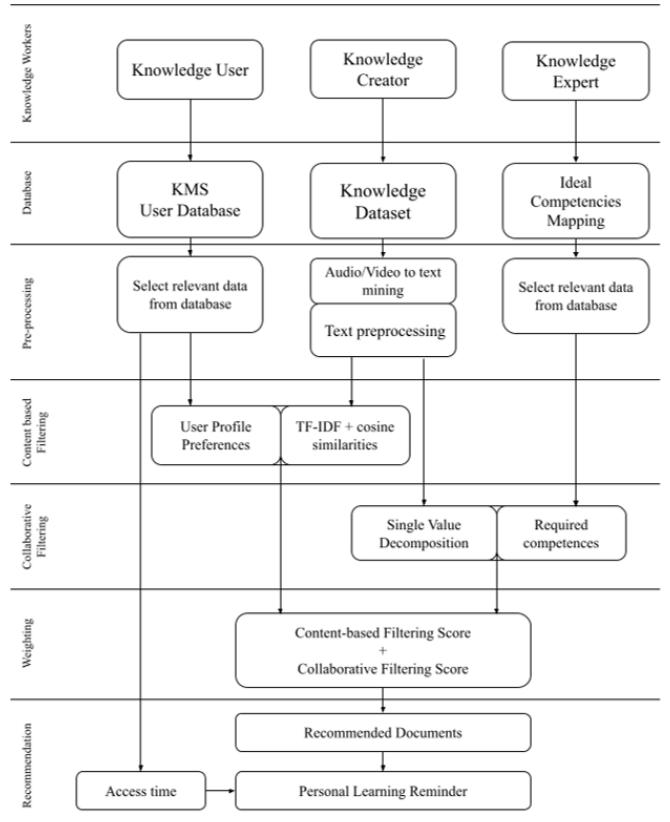


Fig. 3. Proposed recommendation system model

The following lanes consist of technical machine learning algorithms and the follow up solution to reach knowledge users. Fourth lane explains content-based filtering recommendation system to accommodate knowledge user interests. Combining user profile based on history and score of every competence in each knowledge document to calculate their similarity. Fifth lane explains collaborative filtering to cover the company's goal of employee competencies development. Adjusted with user's registered competencies preferences. Combination of content based filtering and collaborative filtering as hybrid recommendation systems is explained in the sixth lane. Weighted method will be used to combine the scores from both algorithms. The last lane explains the follow-up process to actively reach knowledge users based on their access time of knowledge platform.

IV. DISCUSSION

This research result is a conceptual model for knowledge utilization optimization. Only the early phases of machine learning development are covered, because of PT XYZ existing condition. With a broad data source from cross division within the company, this research has developed a model for integration of Therefore this research will serve as guidance for further research about knowledge management especially for organizations with similar backgrounds.

This research is trying to address the incoming challenge of knowledge management. Machine learning development method is deployed to make personalized knowledge platforms, and hybrid combination is deployed to cover multi-agent purposes. Research about evaluation of recommendation relevance to user needs has to be done. Furthermore, evaluation to determine whether multi-agent purposes solutions can be done properly with existing models.

V. CONCLUSION

PT XYZ as the biggest telecommunication company in Indonesia is growing fast despite operating in uncertain conditions. One of the company's focus is to develop digital talent to tackle upcoming challenges. This mission is facing a threat of knowledge utilization decline. Furthermore, this trend can affect company performance if it continues to happen for a long term. As defined by Dong & Yu [3] that advancement of IT such as cloud computing, machine learning, big data and AI have been refining KM practices for years, PT XYZ expects machine learning implementation is able to improve knowledge utilization. The company has set a target to increase knowledge utilization by 10% at the end of the year, and hope this trend continues for the following years.

One managerial implication that can be derived from this study is the implementation of machine learning for understand and improve knowledge utilization despite of its complexity is worth exploring. The conceptual model describe how machine learning implementation is developed and adjusted based on company's condition and needs. Therefore, while development methods are similar, implementation in each field can be unique to each other. Management also needs to measure and compare the effectiveness for each deployment project based on proposed model such as the result of this study.

This research can be used as guidance for further research on knowledge management, or implementation of machine learning specifically recommendation systems in other areas. Data from various sources has to be integrated and prepared ahead of time to cover multi objectives within

the company. Finally, efficient implementation should be deployed by a personalized system to match various individual needs, and brings out the hidden potential of the company's knowledge.

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Paper 72

The mediating role of work engagement in the relationship between organizational identification and employee creativity

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Abstract - The creative industry is a sector that continues to grow and requires employee creativity. The object of this research is the millennial generation who work in the creative sector. This study aims to determine the effect of organizational identification on employee creativity with work engagement as a mediation. This type of research is quantitative research. The data processing technique uses Partial Least Square (PLS). This study uses a purposive sampling technique, by setting certain criteria. This study uses 194 millennial workers who have worked at least 1 year in the creative industry as respondents. The results show that organizational identification has a significant effect on employee creativity, and organizational identification has a significant effect on work engagement in the millennial generation in the creative industry. On the other hand, work engagement has a significant effect on employee creativity and organizational identification has a significant effect on employee creativity in the millennial generation in the creative industry with work engagement as a mediation.

Keywords – Organizational identification, work engagement, employee creativity

I. INTRODUCTION

The creative industry has contributed a lot to Indonesia [1]. In 2019 there was an increase of Rp. 100 trillion per year and will continue to increase. Indonesia's creative economy contributed 7.38% to Gross Domestic Product (GDP) in 2015 [2]. The creative industry is an industry that includes the process of increasing added value resulting from the exploitation of intellectual property in the form of creativity, expertise, and individual talent into a product to increase the welfare of the implementers and the people involved. Creativity is important elements of business in the creative industry, to survive organizations must develop sustainability and maintain a competitive position in the market by increasing the creativity of their employees [3].

In the creative industry, companies must have broad-minded employees with creative ideas. Employees in the millennial generation have an open mindset about new things, are confident to get opportunities and challenges, and will find it easier to express innovative behavior than the previous generation [4]. The characteristics of millennial employees and their creative performance contribute to the company's ability to act innovatively

in the [5]. These millennial generation employees are considered the main workforce that brings effectiveness and innovation to the workplace [6]. Millennial generation employees tend to be more sought after and prioritized. Employee creativity has been treated as important for organizational survival and competition.

The millennial generation itself tends to apply creativity in the world of work. This generation does not only work not to meet personal or family needs. They are very techno-minded and interact more using technology in communicating and working. The importance of creativity at the employee level is vital for all types of organizations today, where the ability of employees in terms of creative thinking is the main source of organizational success [7]. Good management of organizational creativity will increase competitive advantage and company performance. The existence of new thoughts and ideas, new problem solving, simplification of procedures and processes make company activities more optimal [8]

Companies in the creative industry need innovation to develop companies so that they require employee creativity. Innovation does not only include the generation of new ideas, but also their implementation [9]. With so many benefits generated from employee creativity, organizations will reward their employees for creativity that contributes to innovative ideas, services and products [10]. Employees of the millennial generation play an important role in helping organizations achieve innovation and competitive advantage [11].

Creativity and the need to involve employees in creative behavior are important for companies engaged in creative industries [12]. Creativity refers to the generation of new ideas that encourage the development of new products or services or modify existing ones according to market needs [13]. Creativity is considered as something related to cognitive and behavioral processes that are applied when trying to generate new ideas where this capacity can help solve problems while innovation involves applying or turning new ideas into concrete actions [14]. The creativity possessed by each employee helps an organization in realizing its goals. Employees belonging to the millennial generation play an important role in helping organizations achieve innovation and competitive advantage [11].

One way to achieve and increase employee creativity is to increase employee identification with the company.

This will provide motivation for employees to take action and work innovatively [5]. Organizational Identification is a condition of employees' psychological attachment so that they identify themselves with the organization [15]. Organizational identification represents employees' willingness to define themselves as part of their organization [16]. Basically, organizational identification includes two aspects, namely a sense of belonging to the organization and employee awareness of their role in the organization [17]. Thus, organizational identification has a role in building the social identity of organizational members when they are in the work environment or even when members are interacting with the community in their personal lives.

Organizational identification represents the extent to which individuals feel part of and identify with the values and goals of the organization [18]. This alignment enables employees to take innovative actions in developing the company. If in the organization employees have a strong attachment and identification will help employees optimize their work functions better [19]. Organizational identification of an organization will have an impact on the realization of work engagement in employees [20]. If members of the organization identify themselves with the organization, there will be enthusiasm, dedication, and being able to absorb into [21]. Employees who identify with the organization will feel the social support they feel from the leader and the organization they work for. When employees feel the company's support for achieving work targets, employees can be better involved in their work. Work engagement is one of the things that affects work success. If employees feel strong and enthusiastic at work, then they will thrive in their work [22]

Employees who are engaged in a job and focus on the given task will be more intense at work, pay more attention to responsibilities, and are more emotionally connected to the assigned task [23]. That way, employees are fully absorbed in their work so that they can advance the goals and quality of the organization [21]. Employees who have an attachment to the organization are usually full of energy, are actively involved in their work roles (dedication) and are happy to concentrate or are interested in their work [24]. This engagement causes employees to identify themselves psychologically with their work so that they understand that their work is important for themselves and the organization [25].

From several studies that have been conducted to examine employee creativity in various creative industry companies, it is very rare to find research that identifies the effect of organizational identification on employee creativity. Several studies conducted explains that employee creativity is not influenced by organizational identification variables but by other variables [25],[26].

On the other hand, the employee creativity variable can be supported by a mediating variable, namely, work engagement. The novelty in this study looks at previous research [9] that researched employee creativity. The research did not examine the millennial generation, which is a generation that has innovative ideas. One other research regarding employee creativity does not directly see how the millennial generation's creativity is in the creative industry.

This study was conducted among the millennial generation who work in the creative industry sector. This study aims to examine the effect of organizational identification on employee creativity, and the effect of organizational identification on work engagement. Furthermore, the focus of this research is to analyze the effect of work engagement on employee creativity. On the other hand, the purpose of this study will also examine the work engagement variable as a variable that mediates the effect of organizational identification on employee creativity.

II. METHODOLOGY

This type of research is quantitative research with a causal quantitative approach. Causal quantitative research is research conducted to investigate possible cause and effect relationships between research variables. Next, the researcher measured and tested the hypothesis by examining the sample using statistical analysis of the research data.

This study uses a non-probability sampling method, namely the purposive sampling technique. Respondents in this study have criteria for employees who come from the millennial generation which spans the year of birth in 1982 to 2002 and work in creative industry companies and work at least 1 year at the company. The population of this research is millennial generation employees in the creative sector. The population size of this study is unknown. Determination of the sample size in this study using the Lemeshow formula, with a minimum number of 96 respondents. This study used a sample of 194 respondents.

The calculation of respondents is below :

$$N = \frac{x^2(1-p)}{d^2}$$

n = respondents

z = standard value = 1.96

p = maximal estimation

d = sampling error = 10%

Based on the above formula, the results of the calculation of the number of samples show a minimum of 96.04 samples. This study uses 194 respondents to get the data.

This study used a questionnaire to determine or obtain the responses of the respondents. Questionnaires were distributed to the respondents according to the criteria for determining the respondents. In this study, a questionnaire sent to the respondents by providing a Google Form link. In the questionnaire, initially it will explain the purpose of distributing the questionnaire, then an explanation of guaranteeing the confidentiality of respondent data, filling in data from respondents, as well as statements of each research variable that will be filled in using a rating scale.

This study uses Partial Least Square (PLS) analysis which is a component or variant-based structural equation model which will be carried out using the help of data processing applications Smart PLS version 3.0. PLS is a technique for analyzing data for structural models by performing testing the relationship between latent variables or variables that cannot be measured either directly and measuring the validity of the manifest variables (indicators) of each variant-based variable [27]

The variables in this study are: organizational identification, employee creativity, and work engagement. Organizational identification is a psychological engagement between individuals and organizations in which individuals feel a deep affective and cognitive bond and define themselves with the organization as a social entity [18]. Measurement of organizational identification using indicators: mutual belonging among members of the employees, feeling happy about the success of the organization, feeling concerned about the image of the organization [30]

Creativity is a process of employees to find useful new solutions to meet challenges and solve work problems to achieve organizational goals [8]. This study uses four indicators for measuring employee creativity which consist of: critical thinking, risk taking behavior, creative work processes, and problem-solving.

Work engagement is the willingness of employees to work harder, trust the organization, and try to help the success of the organization. Work engagement can be measured using three indicators, namely as follows: vigor, absorption, and dedication. Vigor is energy is the enthusiasm and energy of employees at work, Absorption is passion and enthusiasm and pleasant emotions at work. Dedication is the focus and attention of employees in working emotionally, energy and time.

III. RESULTS

The data analysis process is carried out in several stages. The first stage is the outer model test. In the outer model test, the researcher uses convergent validity, discriminant validity, and reliability tests. The second stage is the inner model test, by identifying the R square value and

predictive relevance. After the two-stage data, then proceed to hypothesis testing.

Outer Model Test

Convergent validity

Table 1 - Outer Loading Value

Variabel	Indicator	Outer Loading	Result
Organizational Identification (OI)	OI01	0.828	Valid
	OI02	0.831	Valid
	OI03	0.813	Valid
	OI04	0.661	Valid
	OI05	0.662	Valid
Employee Creativity (EC)	EC01	0.798	Valid
	EC02	0.822	Valid
	EC03	0.741	Valid
	EC04	0.677	Valid
Work Engagement (WE)	WE01	0.841	Valid
	WE02	0.805	Valid
	WE03	0.808	Valid

Result of the study shows that all indicators are fulfill the requirement for outer loading value criteria.

Discriminant Validity

The table shows that the cross loading value of a construct when compared to other constructs has a greater value, so it can be stated that the indicators contained in this study are discriminantly valid.

Table 2 - DISCRIMINANT VALIDITY

Indikator	OI	EC	WE	Result
OI01	0,828	0,390	0,440	Valid
OI02	0,831	0,497	0,486	Valid
OI03	0,813	0,490	0,482	Valid
OI04	0,661	0,261	0,507	Valid
OI05	0,662	0,219	0,412	Valid
EC01	0,411	0,798	0,512	Valid
EC02	0,390	0,822	0,432	Valid
EC03	0,360	0,741	0,341	Valid
EC04	0,368	0,677	0,386	Valid
WE01	0,549	0,498	0,841	Valid
WE02	0,466	0,430	0,805	Valid
WE03	0,475	0,433	0,808	Valid

Reliability Test

A reliability test is a consistency test of a research construct which in this case the construct in question is a variable that is reflected in the indicators

Table 3 - RELIABILITY TEST

Variable	Composite Reliability	Result
OI	0.873	Reliable
EC	0.846	Reliable
WE	0.859	Reliable

The table shows that the composite reliability of each variable is more than 0.80, so all variables in this study are reliable.

Inner model test

R Square

Table 4 - R-SQUARE

Variable	R Square
EC	0,353
WE	0,372

The inner model test is done by looking at the value of the coefficient of determination (R-square). The R-square value is used to measure the level of variation of changes in the independent variable to the dependent variable. The higher the R-square value, the better the prediction model of the proposed research model

The table shows that employee creativity can be influenced by organizational identification and work engagement with an R-square value of 0.353. The R-square value of 0.353 means that the value of the employee creativity variable which is influenced by organizational identification and work engagement is 35.3% while the remaining 64.7% is explained by other variables not included in this study. Then work engagement variable that can be influenced by organizational identification has an R-square value of 0.372. The R-square value of 0.372 means the value that the work engagement variable can be directly influenced by organizational identification is 37.2%, where the remaining 62.8% is explained by other variables outside the model.

Table 5 - Specific Inirect Effect

Indirect Effect Hypothesis 4	Path Coefficient	T Statistics	P Values	Result
OI → WE → EC	0,242	4,109	0,000	Supported

Predictive Relevance

If the value of Q2 is greater than zero (0) this indicates that the model has predictive relevance, and if Q2 is less than zero (0) indicates that the model lacks predictive relevance (Ghozali, 2014).

$$Q^2=1-(1-R^2 Y)(1-R^2 Z_1)$$

$$Q^2=1-(1-0,353)(1-0,372)$$

$$Q^2=0,5937$$

Based on calculations, the value of Q2 in this study is 0.5937 or greater than 0 which means that the structural model designed to explain employee creativity in millennial generation workers in the creative industry is valid or relevant. it has predictive relevance.

Hypothesis testing

There are three hypothesis to test in this study. Hypothesis is examined by looking at the T-statistics obtained through the bootstrapping procedure. The significant level can be seen from the p-value <0.05 and the T-statistic significant value 1.96 [28].

Table 6 - Direct Effect

Hypothesis	Direct Effect	Path Coefficient	T Statistics	P Values	Result
H ₁	OI → EC	0,262	3,418	0,001	Supported
H ₂	OI → WE	0,610	13,555	0,000	Supported
H ₃	WE → EC	0,397	4,292	0,000	Supported

The results showed that the organizational identification has a significant effect on employee creativity because the p-value was 0.001 and the T-statistic value was 3.418, which means the p-value <0.05 and the T-statistic >1.96. So it can be concluded that H1 which reads "Organizational identification has an effect on employee creativity" in this study is accepted.

The results showed that organizational identification has a significant effect on work engagement because the p-value is 0.000 and the T-statistic value is 13.555, which means the p-value <0.05 and the T-statistic > 1.96. So it can be concluded that H2 which reads "Organizational identification has an effect on work engagement" in this study is accepted.

This study explains that work engagement has a significant effect on employee creativity because the p-value is 0.000 and the T-statistic is 4.292, which means the p-value is <0.05 and the T-statistic is >1.96. So it can be concluded that H3 which reads "Work engagement has an effect on employee creativity" in this study is accepted.

Organizational identification has a significant effect on employee creativity through work engagement because

the p-value is 0.000 and the T-statistic value is 4.109, which means the p-value is <0.05 and the T-statistic is >1.96. It can be concluded that H4 which reads "Work engagement mediates organizational identification and employee creativity variables" in this study is accepted.

IV. DISCUSSION

This study found that organizational identification has an effect on employee creativity with a T-statistic value of more than 1.96, which is 3.418. This can be interpreted that the better the employee's organizational identification, the more employee creativity will increase. The results of this study also show that the feeling of happiness that arises in the hearts of millennial workers when the organization where they work achieves success contributes the most to increasing employee creativity.

Employee creativity is formed when millennial workers pay attention to the opinions of others about the organization they work for. By accepting suggestions, criticisms, and input from others regarding the organization they work for, millennial workers can increase their creativity to support the organization to be even better. When the organization develops for the better, there is a sense of happiness that arises in the hearts of millennial workers which encourages the increase in the creativity of millennial workers.

The results of this study are in line with the findings of a study [29] which states that organizational identification is one way to achieve employee creativity. The results of previous study [30] also found that when employees identify strongly with an organization, employees will feel safe so that they can develop employee creativity while working for organizational success. Research [31] also found that there is a positive and significant relationship between organizational identification and employee creativity.

This study found that organizational identification has a significant effect on work engagement with a T-statistic value of 13.555 or more than 1.96. This means that the better the employee's organizational identification, the higher the employee's work engagement. The happiness felt by millennial workers when the organization achieves success indicates that there is an emotional attachment between millennial workers and their organization. Millennial workers feel that the success achieved by the organization is their success so that the employee feels successful. The results of this study also support the previous research findings [18] that stated a positive and significant relationship between organizational identification and work engagement. The encouragement of organizational identification will create a high spirit of employee dedication so that employees take the initiative to do work outside of their responsibilities.

This study found that work engagement has an effect on employee creativity with a T-statistic value of more than 1.96, which is 4.292. This can be interpreted that the higher the level of employee work engagement, the higher the level of employee creativity of the employee. Millennial workers reflect their attachment to their work and the organization they work for by doing their jobs with passion and energy. The higher the enthusiasm of millennial workers at work, the higher the level of creativity of these workers will increase. The results of this study are in line with the research [32] which states that there is a positive and significant relationship between work engagement and employee creativity. Employees who feel connected to work will be more productive and innovative in completing work than expected. The results of this study also support the findings of Asif et al [11]. It explained that employee involvement is one of the factors of employee creativity and innovation in the workplace.

This study found that organizational identification on employee creativity through work engagement with a T-statistic value of more than 1.96 is 4.109. This can be interpreted that indirectly organizational identification or psychological linkages between employees and the organization can affect employee creativity through the emergence of employee involvement in work.

Millennial workers' creative ideas at work can increase if the worker feels that the success of the organization is his personal success as well as through the millennial worker's sense of enthusiasm and energy at work. The results of this study are in line with the findings of a research [3] which describes that organizational identification affects work engagement, work engagement affects employee creativity. The deeper the worker knows the organization where he works, the stronger the attachment of the worker to the job and the organization where he works. This strong sense of attachment will increase the creativity of workers because these workers see the goals of the organization as their goals and the success of the organization is the success of the workers.

V. CONCLUSION

Organizational identification has a significant effect on employee creativity in the millennial generation in the creative industry, while Organizational identification has a significant effect on work engagement. On the other hand, work engagement has a significant effect on employee creativity. Organizational identification has a significant effect on employee creativity in the millennial generation in the creative industry by mediating work engagement

Employees should create a sense of belonging between employees and the company so that organizational identification can increase where if a strong sense of

belonging is present in employees, then if other parties give any insults to the company, employees will feel sad because they feel part of the company. Company and such insults were given to him as well. Companies can encourage employees to further increase their creativity to the maximum, such as by providing training if they are to have more creative ideas and make it easier to find and determine solutions to problems faced by the company. The company as a place to work should create a comfortable workplace atmosphere for employees and the company also needs to provide supporting facilities following the employee's job description. In this way, the work engagement variable will strongly mediate the effect of organizational identification on the employee creativity variable in the millennial generation in creative industry companies.

Further research can explore how employee creativity in companies in the creative industry is related to other variables that can increase creativity, such as the work environment and performance management systems that can make employees feel comfortable and happy so that their creativity will increase. Researchers can develop research objects in Generation Z who are starting to get involved in the organization. Comparisons between employees across generations will be able to contribute to increasing employee effectiveness in their work environment.

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Paper 73

Evaluation Of Change Management In PT XYZ

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The 7th International Conference on Management in Emerging Markets

Abstract - PT XYZ is a company engaged in the manufacturing and distribution of vaccines, pharmaceuticals, and poultry equipment. In producing its products, the production process has complied with GMP (Good Manufacturing Practice) and CPOHB (Cara Pembuatan Obat Hewan yang Baik). The slowing growth of the poultry population domestically has slowed PT XYZ's revenue. It makes them take the initiative to enter the agricultural market as a potential market considering Indonesia is an agricultural country.

The change initiatives to enter the agricultural market has yet to be evaluated. The purpose of this study is to evaluate the management of changes carried out in entering the agricultural market. The research used a mixture of quantitative through questionnaires and qualitative through interviews using the DICE and McKinsey 7S framework. Using both frameworks would provide a better understanding of the change management evaluation with the quantitative result using the DICE framework as the predictor of success and opportunity for improvement using a more holistic factor in the McKinsey 7S framework.

Using the DICE framework, the change management carried out is in the "Win" zone. This means that the change management carried out has a high probability of success. The McKinsey 7S framework is used to analyze improvement opportunities. Bureaucracy, operational and monitoring system comprehension, number of team members adequacy, knowledge of team members, and the adequacy of the training carried out are things that are then identified for further evaluation. This is then searched for the root cause and opportunities for improvement.

Keywords - Change Management, DICE, McKinsey 7S

I. INTRODUCTION

The Covid 19 Pandemic caused recession worldwide, including in Indonesia. Restricted mobilization, temporary restricted economic activity, and layoffs affected many industries. The industries need to transform their business or business process to be able to sustain in this condition.

Since 2021, PT XYZ has initiated the change initiative to enter a new market, the agriculture market. The agricultural market is related to any product for cultivating land and

raising crops or non-crops, such as for gardening. Example of agricultural market product is pesticide, seed, and fertilizer. The pesticide product potential alone is more than 35 Trillion rupiah.

The decision to enter the agricultural market involved organizational change where selected existing Poultry Salesman has to sell poultry and agricultural product, there are also agricultural salesmen who specialized in selling only agricultural products. The agricultural salesman's working area is across several branches. Different chains of command make communication between related party is becoming more important. Adjustment in the current operational & monitoring system is also made to accommodate the agriculture market needs.

Having a change initiative and executing the change initiative is not enough for the company to successfully enter the agriculture market. Communication on the change initiatives, the change management team workload, the company's culture, and current knowledge regarding the agriculture market are several factors that will affect the change management success.

PT XYZ has yet to evaluate its change management initiative. The evaluation of the change management initiatives can provide insight into current change management effectiveness and opportunities for improvement. The research aims to evaluate the change management effort that has been done by PT XYZ.

II. METHODOLOGY

This research was conducted using a mixed-method of quantitative and qualitative methods. A quantitative method is an approach to analyzing relationships among variables using an instrument that can result in quantifiable data [5]. The quantitative approach is done by collecting data through questionnaires. A qualitative approach is an approach to exploring and having a better understanding of an issue through interviews, observation, or documents [5]. A questionnaire is used to evaluate the possibility of success using the DICE framework [1]. Evaluation using the McKinsey 7S framework will also use a questionnaire. The respondents are employees that are involved in the change management initiative. The evaluation process in the research is done as follow :

1. Literature review

The main reference is the DICE framework and the McKinsey 7S framework. Journals & books are also used as supporting resources in this research.

2. Data collection

The data collection process is done using questionnaires. The answer provided is using a modified Likert scale that consists of 4 scales. The DICE questionnaire and the McKinsey 7S questionnaire are developed based on each framework and have been consulted with PT XYZ management. The respondents for both questionnaires are the same, which are the employees that are involved in the change management initiative.

3. Assessing the data collected

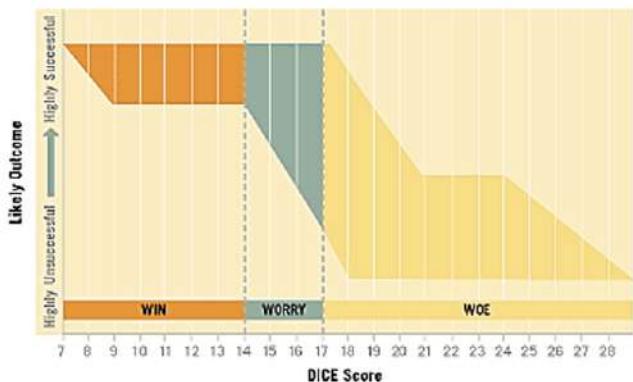
The score for each factor in the DICE framework and the McKinsey 7S framework is calculated by dividing the sum of the score on each statement from all respondents by its ideal score/criterium and multiplying it by 4 to give a score ranging from 1 to 4.

The interpretation of the DICE factor will be using the DICE calculation as follow :

$$\text{DICE score} = D + (2 \times I) + (2 \times C1) + C2 + E \quad (1)$$

After the calculation, the score can be interpreted as shown in Fig. 1. as follow:

- a. Score 7-14: Win Zone. Very likely to succeed.
 - b. Score 14-17: Worry Zone. Hard to predict, risky and need action to move from Worry Zone to the Win Zone.
 - c. Score 17-28: Worry Zone. Unlikely to succeed. Need immediate strong action regarding the four factors
- The interpretation of the McKinsey 7S factor is combined with observation and interview to give a better understanding of the McKinsey 7S score result.



(Source : Sirkin, Keenan, & Jackson, 2005)

The DICE framework is used to quantify the possibility of change management success. The 4 (four) factors in the DICE framework are duration, integrity, commitment, and effort. Duration, based on the study conducted by The Boston Consulting Group, a frequently reviewed initiative is more likely to succeed than a short period of initiative that is not reviewed frequently. The integrity factor refers to the extent that which the company relies on the change initiative team to implement the change initiative. The team can consist of managers, supervisors, and staff to have the ability to cope with the change initiative. The change initiative usually involves complex issues, pressure, extra effort, and issues along the way. That is why the performance integrity of the team is needed. Commitment factor to change is needed in two groups, the first is the commitment from the senior manager (also known as C1) and the second is the commitment from the employee that will be impacted or undergoing the change (also known as C2). Commitment from the senior manager (C1) is the energy that gives the change initiative to thrive. There is never enough commitment from the senior manager. The more the senior manager (C1) displays their commitment visibly, the more it drives the willingness of the employee (C2) to support the change initiative and is more likely to succeed. Commitment from the employees (C2) is also important to make the change initiative work. Communication is the key to making the commitment from both sides delivered, seen, and understand. The effort factor considers the increasing workload due to change initiatives. The workload needs to be managed carefully, as the increasing workload is more likely to cause issues or even resistance. Ideally, the workload should not increase more than 10% [1], beyond that, the employee will become overstretched, morale will fall, conflict may arise, and can compromise the change initiative's success.

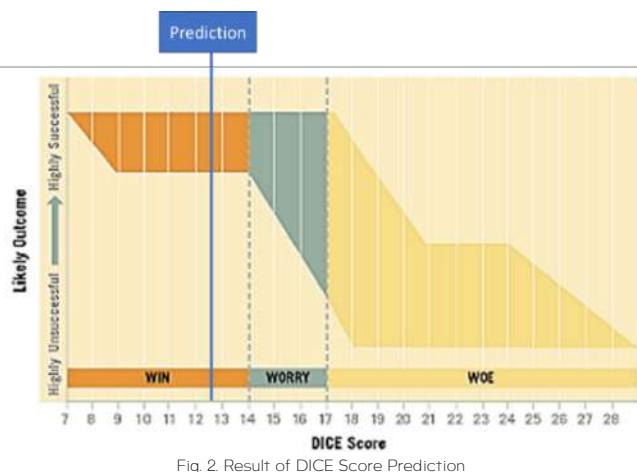
The 7 (seven) factors in the McKinsey 7S framework are system, skill, staff, style, structure, system, and shared values. The relationship between system, skill, staff, style, structure, system, and shared values are the building blocks of effective organizational change [2]. Strategy is actions that are planned to achieve company goals. A company needs to have a strategy in order to survive and have a sustainable competitive advantage. The structure factor discusses the hierarchy in the organization so they can continually communicate among themselves and have decision-making capabilities among a large group of people [4]. The system is the procedure, formal or informal, in conducting business activities. The style factor refers to a pattern of company management action, response to change, priority making decisions, how they spend their time, and what they pay attention to [3]. Staff in McKinsey 7S frameworks refer to how human resources in the company are developed. The skill factor refers to what the company does best, the ability of the company. Shared

values can be described as guiding principles, values, or the future direction of an organization. Organizational culture is another term for shared values, beliefs, and norms that influence the way employees think, feel, and act toward others [3].

III. RESULTS

The DICE and McKinsey 7S questionnaire was developed based on the understanding of the DICE and McKinsey 7S framework. Based on the DICE questionnaire, The DICE calculation result is shown below:

$$\text{DICE score} = D + (2 \times I) + (2 \times C1) + C2 + E \\ = 1,81 + (2 \times 1,78) + (2 \times 1,78) + 1,62 + 2,13 \\ = 12,67$$



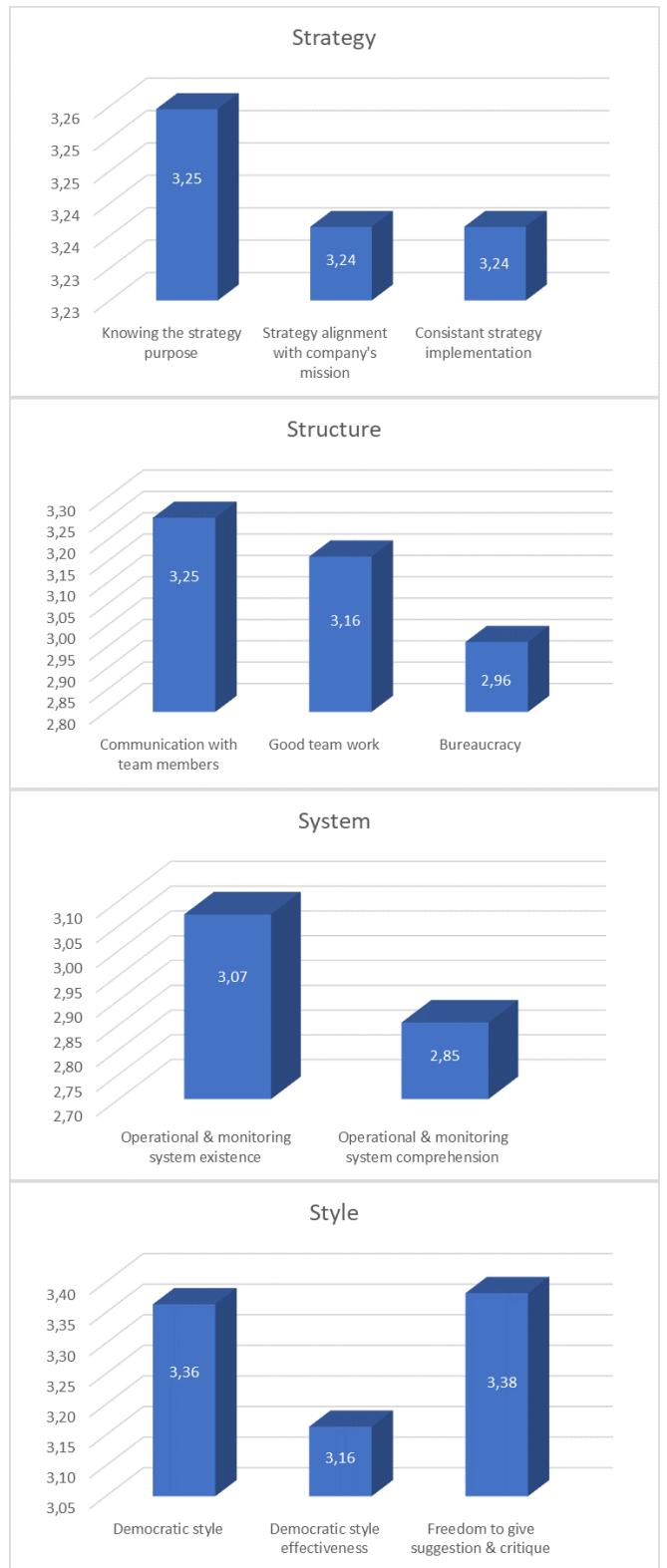
The initiative to enter the agriculture market DICE score is 12,67. As shown in Fig. 2, the score is in the win zone, which means the initiatives have a high possibility of success. However, the score is near the worry zone and is recommended to be analyzed further.

The McKinsey 7S questionnaire is using modified Likert scale that consists of 4 scales. The result using McKinsey 7S is interpreted using the interval shown in Table 1.

Table 1 - McKinsey 7s Questionnaire Score

Interval	Indicator
1 – 1,74	Very poor
1,75 – 2,49	Poor
2,5 – 3,24	Good
3,25 - 4	Very Good

The McKinsey 7S questionnaire resulted in a good and very good factor in all the 7 (seven) factors as shown in Fig. 3, below.



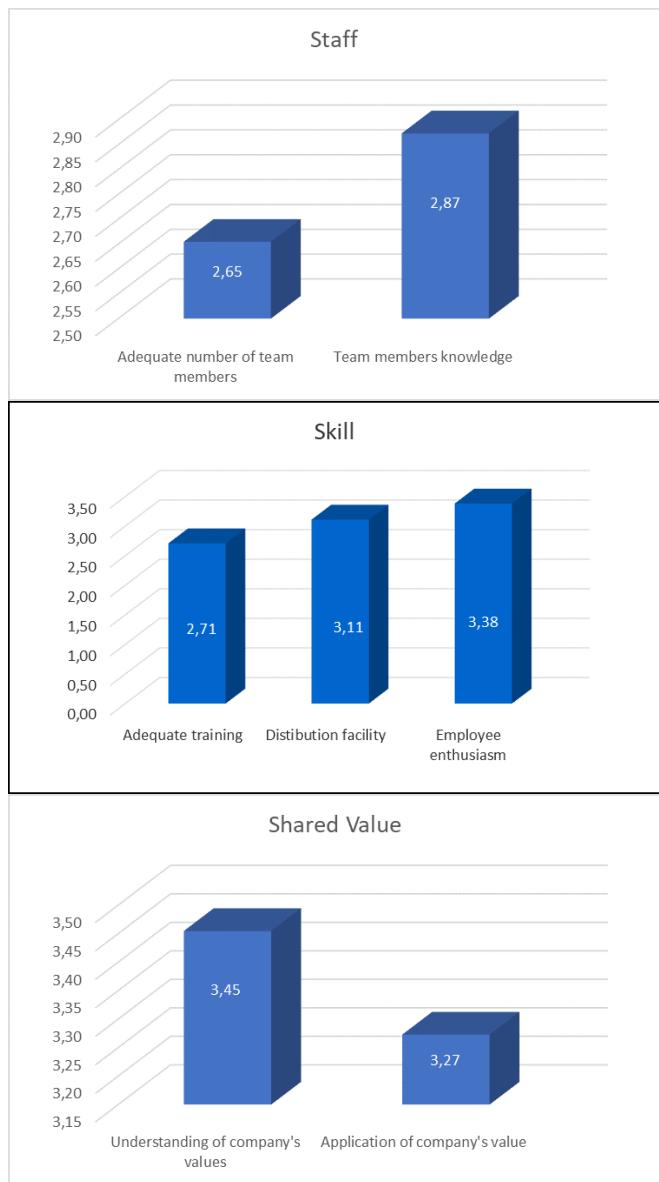


Fig. 3. McKinsey 7S Questionnaire Result

Based on the result, the factor that has a score below 3 (three), is analyzed further using interviews. Bureaucracy in the structure factor, operational & monitoring system comprehension in the system factor, adequate number of team members & team member knowledge in the staff factor, and adequate training in the skill factor have scores below 3 (three).

IV. DISCUSSION

The strategy factor in the McKinsey 7S framework has an average score of 3,24 out of 4, which is considered a good score. PT XYZ had broken down the strategy into initiatives within a smaller timeframe to be monitored. The result of the overall Duration factor on the DICE framework shows that 27,27% of respondents strongly agree and 64,85% of respondents agree that the initiatives have periodic monitoring and are effective to enter the agriculture market. Comparing the result of

the strategy factor in the McKinsey 7S with the duration factor in the DICE questionnaire shows that the team knows and acknowledges the monitoring effort and the result of the initiatives. Working and aligning employees with the company's strategy is important to effective implementation [6].

The adequate number of team members' questions in the McKinsey 7S questionnaire shows that 30,91% of respondents disagree and 7,27% of respondents strongly disagree that there is already an adequate number of team members. The inadequate number of team members due to additional tasks to support entering the agricultural market had increased team members' workload. This correlates with the DICE questionnaire result, where 34,55% of respondents disagree and 7,27% of respondents strongly disagree with only little change in their workload as an effect of entering the agriculture market. Although there is an increasing workload, it does not stop the team member from supporting the initiatives to enter the agriculture market as shown in the DICE questionnaire. In the DICE questionnaire, 27,27% of respondents strongly agree and 58,18% of respondents agree that they are willing to work more than 10% of current working hours to support the agriculture market.

The employee enthusiasm scored 3,38 on the skill factor of McKinsey's questionnaire. This correlates with the DICE questionnaire in the commitment from employee factor, where 36,36% of the respondents strongly agree and 56,36% of the respondents agree that they understand the benefit and importance of entering the agriculture market. The understanding makes a positive environment where the team members are excited and committed to bringing the initiatives to success. This is also related to the Top Management commitment factor in the DICE questionnaire where 32,73% of the respondents strongly agree and 56,36% of the respondents agree that the Top Management of PT XYZ always explains the importance of entering the agriculture market.

V. CONCLUSION

PT XYZ's change management to enter the agriculture market has a high possibility of success as shown in the result of the DICE framework questionnaire. The result of the DICE framework is 12,67, near the worry zone threshold of 14. Using the McKinsey 7S framework, potential opportunities for improvement are found in the structure, system, staff, and skill factors. Bureaucracy in the Structure factor scored 2,96, operational and monitoring system comprehension in the System factor scored 2,85, the adequate number of team members in the Staff factor scored 2,65, the team members' knowledge in the Staff factor scored 2,87, and adequate training in the Skill factor scored 2,71. Those factors are then discussed

to find the root cause and opportunities for improvement recommendations.

ACKNOWLEDGMENT

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Paper 74

Integrating Change Management and Knowledge Management to Support Changes In Business Direction and Corporate Strategy at PT Hutama Karya (Persero)

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The 7th International Conference on Management in Emerging Markets

Abstract - In a change in the direction and strategy of the company, it is necessary to involve all members of the organization who have the knowledge and competence to make changes. According to research, 70% of change programs fail to achieve their goals, and most of them are due to a lack of change management efforts. This change management effort is closely related to the knowledge management implemented by the company to develop the organization and meet changing business needs.

The purpose of this study is to find out how the integration of change management and knowledge management can support the company's efforts to implement changes in business direction and company strategy in the Company's Long-Term Plan (RJPP). The framework used is a gap analysis in the change process using the ADKAR model from Jeff Hiatt and a critical knowledge gap analysis based on the knowledge management implementation strategy from Tjakraatmadja & Kristinawati.

The authors get the results that in the change process there are still gaps in change management and critical knowledge. To integrate change management and knowledge management can be done by evaluating and creating knowledge so that critical knowledge gaps can be overcome. Furthermore, the critical knowledge is used to support the knowledge elements in ADKAR so that the other 4 elements can be increased or maintained at their level.

Keywords - change management, knowledge management, gap analysis, ADKAR model, critical knowledge, knowledge creation

I. INTRODUCTION

In June 2021, based on changes in macroeconomic, sectoral, and corporate assumptions, the impact of the Covid-19 pandemic, and directions from Shareholders, PT Hutama Karya (Persero) hereinafter referred to as HK, made changes to the Company's Long-Term Plan (RJPP) for the 2020-2024 period which has been compiled in 2020, including directions, strategies, and corporate actions. The RJPP, which was compiled in 2020, is actually relevant and continues the direction and strategy of the 2014-2018 RJPP, where the company focuses on infrastructure development and business diversification.

Although the two RJPPs were prepared during the Covid-19 pandemic, they both have fundamental differences in internal and external assumptions that affect the direction of business development and the company's main strategy. This fundamental change requires considerable change management efforts because the company has already implemented the previously planned directions and strategies. Top management must be able to communicate this change to all company employees because the company's employees are the company's capital and the driving force of the company's business activities.

Tjakraatmaja and Kristinawati [11] explain that the rapid demands for changes in the order of organizational life are mainly caused by the rapid growth and development of knowledge. Knowledge management will be the key to implementing this change management because the mindset and knowledge of employees are strongly influenced by how the company implements knowledge management. Good knowledge management will create strong and agile organizations because they have updated competencies that are always updated, which are needed to improve innovation or organizational performance.

Based on the background and business issues, this research needs to answer the following questions:

1. What is the capability and knowledge gap experienced by HK in implementing changes in business direction and company strategy?
2. How can the integration of change management and knowledge management support the implementation of changes in business direction and corporate strategy?
3. What are the recommendations for the integration of change management and knowledge management to support the company's business in the future?

This study aims to obtain a suitable integration model between change management and knowledge management to create an organization that is agile and ready to face changes in business direction and company strategy.

II. METHODOLOGY

Grimolizzi-Jensen in Tang [11] in Paulia [7] defined change management as focusing on the broader impact of change, particularly on people as individuals and teams move from the current state to the future state for achieving the lasting benefit of change. This is supported by the statement from Bain & Company, [1] in Paulia [7], that the implementation of change management requires the leaders' support and control to focus on the result, overcome barriers to change, repeatedly communicate powerful messages to subordinates, and continuously monitor progress to confirm the goal are met.

The ADKAR model as stated by Hiatt [2], reflected the necessary building blocks for individual change within organizations and is intended to be a coaching and change management tool to help organizations change. ADKAR is an abbreviation for Awareness of the need for change, Desire to support and participate in the change, Knowledge of how to change, Ability to implement change, and Reinforcement to sustain the change. These elements represent the most basic requirements for achieving and sustaining a change that cannot be skipped or reordered.

All five elements of the ADKAR model are sequential. Therefore, Mulder [5] in Paulia [7] identified that the ADKAR model helps determine the next steps to achieve the right goals. Other than that, it also identifies, with the benefit of hindsight, what changes have not been successful. This evaluation is important to help realize the change after all.

Swain & Ekineea [10] in Tjakraatmadja & Kristianawati [12] states that Knowledge Management is a management tool to create productivity, quality, profitability, and organizational innovation by combining KM with Business Strategy to achieve business goals as well as organizational performance and operational performance.

Tjakraatmadja & Kristianawati [12] underlined that the principle that KM planners must adhere to is: "KM is a management tool to achieve organizational goals more effectively". Therefore, the formulation of the KM Implementation Strategy must refer to the Organizational Strategy; or it can also be said that the KM Implementation Strategy is part of the Organizational Strategy and KM plays a role in supporting the Business Strategy.

Dr. Ann Hylton [3] in Tjakraatmadja & Kristianawati [12], explains that knowledge mapping is a process that begins with surveying, assessing, and connecting information, knowledge, competencies, and skills possessed by individuals and teams in organizations. And then Tjakraatmadja & Kristianawati [12] reinforce that knowledge maps facilitate the gap analysis process between the

knowledge needed to support business targets and the available knowledge.

Nonaka & Takeuchi [6] in Tjakraatmadja & Kristianawati [12] describes the existence of four basic patterns of knowledge creation or conversion between individual knowledge and organizational knowledge, which may occur within an organization, which is known as the SECI concept, which stands for socialization, externalization, combination, and internalization.

Zelenkov [13] stated that knowledge is the main source of organizational changes in the broad sense, including both evolutionary (incremental) and transformational (radical) processes, managerial and technological innovations, changes driven by top management and initiated at the operational level, covering both the organization as a whole and its subsystems. From this perspective, the most important factor is not only the ability of the organization to learn and develop but also the capability to realize proposed changes. Therefore, change management as a managerial discipline should be considered in conjunction with knowledge management. Knowledge Management and Change Management (CM) are complementary activities, only the joint development of these two management disciplines provides the greatest efficiency.

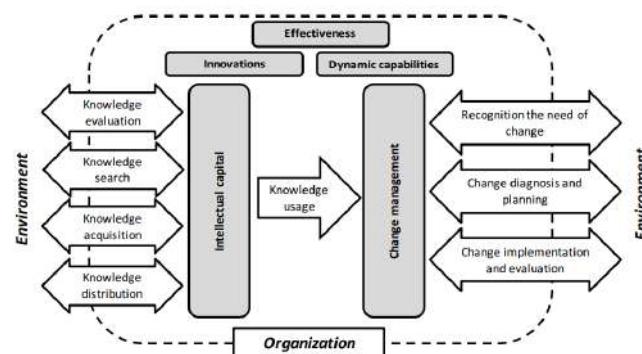


Fig. 1. Sources of organizational effectiveness (Zelenkov, 2016)

Zelenkov [13] underlined that the value of IC is realized via changes, and the most important parts of the change process are change detection, change planning, and change implementation. Both these practices, KM and CM promote dynamic capabilities, innovation, and eventually effectiveness of the organization.

This research's research methodology uses qualitative research by conducting desk research such as literature study, company data, internet data collection, observations and interviews. Observations are suitable for collecting data on the natural behaviors of the research object. After the observations, the interview will conduct as further research. Interviews are optimal for collecting data and seeing people's perspectives, experiences, and other data explanations that need to be explored.

The author will use the ADKAR model for conducting assessments on the people dimension and focus on the result of change management. In ADKAR there is the keyword "Knowledge" which relates to the knowledge management needed by employees to be able to make changes desired by the company. With a KM implementation strategy that is following the company's strategy, it is expected to support the process of change made by the company in business direction and company strategy.



Fig. 2 Conceptual Framework of Research Project

The respondents of this project will be the BOD-1 (Executive Vice President) and BOD-2 (Vice President) for assessment of the change management initiatives using the ADKAR models and critical knowledge management mapping based on knowledge management strategy from Tjakraatmadja & Kristinawati. Detail of the respondents as follows:

Table 1. Detail of Respondents

No	Remark	Position	Division	Exp
1	EVP 1	Executive Vice President	Corporate Planning (Corplan)	29 years
2	EVP 2	Executive Vice President	System, IT & Research Technology (SIT)	24 years
3	EVP 3	Executive Vice President	Human Capital (HC)	29 years
4	VP 1	Vice President of Corporate Planning	Corporate Planning (Corplan)	12 years
5	VP 2	Vice President of System Management	System, IT & Research Technology (SIT)	12 years
6	VP 3	Vice President of Building Information Modelling (BIM)	System, IT & Research Technology (SIT)	12 years
7	VP 4	Vice President of Learning & Development	Human Capital (HC)	9 years

The reason for selecting the respondents was based on the duties and responsibilities carried out by each respondent in the company's business processes. I see that all of these respondents are the people closest to top management (BoD) because they are in the head office and often interact directly in discussions and in making strategic company decisions.

The interviews are conducted with online questionnaires with confirmation using interviews. The concept of this interview is to get direct data from the user Interview Guidelines of the ADKAR Change Model [2] and critical knowledge management mapping using the KM Planning Strategy from Tjakraatmadja & Kristinawati [12].

16 questions on the ADKAR model, which is consist of 4 questions on Awareness, 3 questions on Desire, 3 questions on Knowledge, 3 questions on Ability, and 3 questions on Reinforcement. Meanwhile, questions regarding critical knowledge creation is divided into 2 levels, BOD-1 consisted of 9 questions, while BOD-2 consisted of 15 questions.

III. RESULTS

A. ADKAR Result Analysis

After the interview was conducted, further analysis was carried out to obtain key information based on the results of the interview according to the respondent's position. Based on the key information above, it can be done an analysis of the interview results based on ADKAR's elements as follows:

1. Awareness

All related EVPs and VPs are aware of changes in the business direction and company strategy in the 2020-2024 RJPP and the benefits of these changes. However, not all of them know the causes of change and the purpose of this change, so it can be concluded that their concern for change is still not deep, only at the external level, namely on the benefits of change, or only focusing on the direct impact of change.

2. Desire

Although all EVPs have different opinions regarding the purpose of changing business direction and company strategy, all EVPs and VPs have felt and imagined what they should prepare for changes in business direction and company strategy.

3. Knowledge

Knowledge problem is a serious issue because there are new core competencies that must be implemented by the

company in the future. If we look at issues from the level of awareness and desire for knowledge, this communication problem could be caused by the lack of easy access to information about changes, so that knowledge about changes is not conveyed properly.

4. Ability

The ability of EVPs and VPs to implement changes in business direction and company strategy cannot be instant (fast). They still need time and assistance to improve their skills and provide new experiences in dealing with change. Good skills and experience will help them to eliminate any potential barriers that may occur in the future.

5. Reinforcement

Despite the limited knowledge and abilities that are not optimal and the lack of support from Top Management, the EVPs and VPs have tried to provide explanations and socialization to their teams and set benchmarks (standards) for successful implementation. This is a positive side, that with some limitations they still have the awareness and desire to implement changes in business direction and company strategy.

Based on the results of ADKAR's element analysis above, it can be diagnosed that the change management capability gap in the changes in business direction and company strategy that occurred in HK is as follows:

Table 2. Analysis Results of ADKAR Model on BOD-1 and BOD-2

Elements	Low	Moderate	High
Awareness of the need for change		X	
Desire to support and participate in the change			X
Knowledge of how to change		X	
Ability to implement the change	X		
Reinforcement to sustain the change		X	

From the table above, there is a change management capability gap in the change management process, namely the existence of strong Desire and Reinforcement efforts, compared to weak Ability. This weak ability condition needs to be evaluated and strengthened along with increasing Awareness and Knowledge through the integration of change management and knowledge management.

B. Critical Knowledge Analysis

After the interview was conducted, further analysis was carried out to obtain key information based on the results of the interview according to the respondent's position. Based on the knowledge evaluation, it can be concluded that HK's critical knowledge in Core Competency is as follows:

1. There is no Core Competency that HK has the most control over, but its control can be said to be balanced between Construction Core Competency and Financial Core Competency at the Moderate level. Meanwhile, the competency with the weakest mastery is Specific Segment Competency, especially in the fields of Building Information Modeling (BIM), cloud technologies, CDE & digital collaboration tools, AR/VR technologies, 3D printing, and modular construction & prefabrication.
2. Knowledge and experience are both seen as influential in mastering the 3 core competencies, it is necessary to transform tacit knowledge into explicit knowledge from experienced people so that everyone can learn the experience in the form of new knowledge.
3. Although the level of mastery is different, each of these Core Competencies has a specific area that needs to be developed, or becomes a knowledge gap, namely:

Table 3. Critical Knowledge Gap Area of Core Competency

No	Core Competency	Critical Knowledge Gap Area	Level of Gap
1	Financial Core Competency	Pre-bid & Bid Submission	Moderate
2	Construction Core Competency	Project Management	Moderate
		Commercial Management	Moderate
3	Specific Segment Competency	Knowledge & Expertise, especially in the fields of Building Information Modeling (BIM), cloud technologies, CDE & digital collaboration tools, AR/VR technologies, 3D printing, and modular construction & prefabrication.	High

IV. DISCUSSION

A. Change Management Strategy

Of the 5 elements in ADKAR, 2 elements must be maintained and 2 elements that must be improved, as well as 1 element that must be evaluated first, so that change management can run well.

1. Awareness
 - o Build Effective Communication between BOD to BOD-1 and BOD-2
 - o BOD must build Effective Sponsorship by showing specific motivation for this change
2. Desire
 - o Maintain employee's personal situation, personal values, and motivation

3. Knowledge

- o Focus group discussion between BOD, BOD-1, and BOD-2 about the context of change
- o Building knowledge with training programs in the area of core competency
- o Improve the willingness to learn the knowledge using the milestone of individual change

4. Ability

- o Identify and assess the potential resistance forces and challenges
- o Establish a Project Management Office (PMO) for each Core Competency to produce day-to-day involvement from BOD-1 and BOD-2
- o Access to Subject Matter Experts to demonstrate how the core competency can be implemented in a real-life environment
- o Adoption and Performance Monitoring to see the progress of ability improvement

5. Reinforcement

- o Celebrating success in change initiation
- o Recognizing people for their roles
- o Provide rewards to increase the spirit of change
- o Listening to opinions and asking for feedback on the ongoing change process

B. Knowledge Management Strategy

Based on the knowledge gap that has been analyzed, it is necessary to develop a knowledge creation strategy to reduce the gap. The purpose of this strategy is to increase knowledge of the core competencies of employees who are the driving force in the process of changing business direction and company strategy For Pre-bid & Bid

Table 5. Knowledge Management Strategy based on Critical Knowledge Gap

No	Knowledge Gap Area	SECI Process	Knowledge Creation Strategy
1	Pre-bid & Bid Submission	I & S	<ul style="list-style-type: none"> • Learn Before • Knowledge Café • Learn After
2	Project Management	E & S	<ul style="list-style-type: none"> • After Action Reviews (AAR) • Training • Communities of Practices (CoP)
3	Commercial Management	E & S	<ul style="list-style-type: none"> • After Action Reviews (AAR) • Training
4	Knowledge & Expertise	S	<ul style="list-style-type: none"> • Training • Storytelling • Communities of Practices • Rotation

Submissions, we recommend the Internalization process through the Learn Before strategy and Socialization through the Knowledge Café strategy. The business process with this knowledge has been carried out by the company for years, but it needs strengthening so that it minimizes errors in the tender process and the winning rate can increase.

For Project Management, we suggest an Externalization process through the After-Action Reviews (AAR) strategy and Socialization through the Knowledge Café and Training strategy. By conducting periodic reviews of project implementation, it is expected to correct errors that occur and improve project management capabilities. This is also supported by sharing session activities and formal training which are part of the socialization to strengthen employee knowledge.

For Commercial Management, we recommend an Externalization process through the After-Action Reviews (AAR) strategy and Socialization through the Training strategy. By conducting periodic evaluations of the commercialization process, it is expected to increase the commercialization capabilities of the employees. This is also supported by formal training activities so that employee knowledge increases.

For Knowledge Gap Areas that have a high level, namely Knowledge & Expertise, we suggest a Socialization process through Storytelling, Communities of Practices, and Rotation. We do this because HK is not used to managing knowledge that can generate added value for the company. In addition, the management of the internal experts in the company is also not very good and is still not evenly distributed in each work unit, so the expertise they have cannot be transmitted and documented properly. By conducting socialization, it is expected that all employees (especially the Human Capital Division) have the same understanding, mindset, and concept regarding the management of Knowledge & Expertise through the transformation of business direction and company strategy. In addition, we also recommend that Socialization be carried out with formal training and certification so that employees have the right competencies according to transformation needs.

This is supported by Tjakraatmadja & Kristinawati [12] that the socialization process is suitable to be used to equalize understanding or the formation of new norms, cultures, paradigms, mindsets, or concepts. In addition, Krogh, Ichijo, & Nonaka [4] that knowledge enabling is more effective because it focuses on facilitating the effectiveness (strengthening) of relationships and communication to support the process of sharing (socializing) knowledge between people, both internally in the organization or with external parties

C. Integrating Change Management & Knowledge Management

As stated by Zelenkov [13] that knowledge is the main source of organizational changes in the broad sense so the change process must be accompanied by knowledge management.

To link knowledge management with the change process, critical knowledge is used here based on the results of knowledge mapping and evaluation, wherein the critical knowledge some gaps must be covered, namely Pre-bid & Bid Submission, Project Management, Commercial Management, and Knowledge & Expertise.

On the other hand, to cover the knowledge gap, organizational readiness is needed which can be seen from the results of the ADKAR model analysis, where there is a change management capability gap that must be increased in Awareness, Knowledge, and Ability. The existence of these 3 elements of the capability gap, especially the Knowledge element, is a meeting point in the integration of change management and knowledge management.

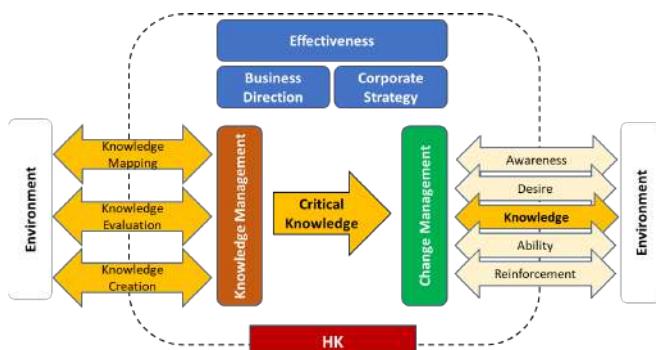


Fig. 3. The Role of Critical Knowledge in the Change Management Process

V. CONCLUSION

Based on the observation and analysis that have been performed and described in the previous chapter, this chapter will conclude the result of the research. Below is the conclusion on each research objective.

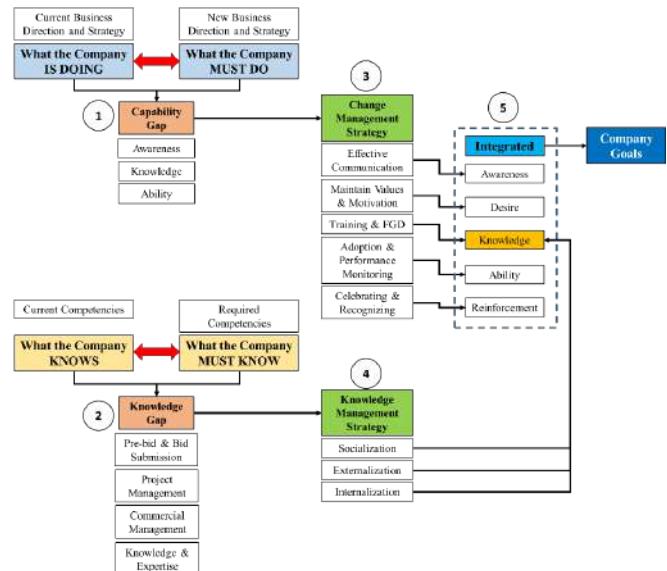


Fig. 4. Integrating Change Management and Knowledge Management to Support Changes In Business Direction and Corporate Strategy

The change management capability gap experienced by HK in implementing changes in business direction are elements of Awareness, Knowledge, and Ability. Meanwhile, the critical knowledge gap obtained from the knowledge evaluation covers 4 competency areas, namely Pre-bid & Bid Submission, Project Management, Commercial Management, and Knowledge & Expertise.

Integration of change management and knowledge management can be done by evaluating knowledge and creating knowledge so that critical knowledge is obtained. Furthermore, the critical knowledge generated is used to support the knowledge elements in change management (ADKAR elements) so that other elements can be improved or maintained. With the fulfillment of the necessary critical knowledge and the availability of solid change management capabilities, this integration will be able to support the implementation of changes in business direction and corporate strategy as stated in the RJPP of 2020-2024.

To support the company's business in the future, we must always pay attention to the condition of knowledge within the company and how that knowledge is communicated (distributed), then we need to check and ensure that all organizational components are ready to make changes with indicators of change management elements.

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Paper 75

The Relationship Between Employee Experience and Turnover Intention in Education Technology Industry: A Case Study on PT Kolaborasi Edukasi Nusantara

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ICMEM

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Abstract - PT Kolaborasi Edukasi Nusantara is still experiencing problems with the data regarding employee turnover intention. The existing human resources have not been able to map the factors and reasons for turnover in the company. Therefore, this study aims to look at the factors that influence turnover intention at PT Kolaborasi Edukasi Nusantara and identify problems regarding the physical, technology, and cultural environment (employee experience) which lead to the possible turnover intention. The researcher conducted a quantitative method by distributing questionnaires to collect data from 49 employees and continued to analyze with simple and multiple linear regression. The researcher also conducted a qualitative method using the semi-structured interview to validate the results of the questionnaire. This study indicates that employee experience simultaneously has a negative and significant relationship with turnover intention. The results of the findings will enable the human resource to take action regarding the appropriate employee experience thus turnover intention can be minimized.

Keywords - Education Technology; Turnover Intention; Employee Experience; Physical Environment; Technological Environment; Cultural Environment.

I. INTRODUCTION

Running a technology education start-up takes a lot of competent and talented human resources to manage company resources to compete and survive [1]. Employees are one of the most significant elements that must be considered in a company [2], especially for a start-up that is just developing. As explained by Ardana, Mujati, & Utama [3], the success and failure of a company are determined by every human resource in it. The biggest challenge for the human resources department is selecting and determining the right person to fulfill the qualifications given by the company. The success of a company's goals depends on the actions of managers in managing their human resources [4]. The actions taken will considerably affect the conditions and performance of employees and their continuance in the place. As mentioned in Mary [5] that employee loyalty is also an essential aspect of the company. If employee loyalty in the company is low, many workers will resign and hinder the company's operations. This is what is usually better known as employee turnover. Therefore, De Connick [6] stated that every organization and company should know and understand the reason

turnover occurs. As there is an increase in the idea of work environment and company culture among companies and organizations, it is proven that companies are also increasingly familiar with the term employee experience which is attached to every employee in the workplace.

PT Kolaborasi Edukasi Nusantara is an online education platform that focuses on improving the abilities of young talents following the skills required by the creative industry. Since PT Kolaborasi Edukasi Nusantara is engaged in providing educational services, the presence of a workforce is very important and needs to be considered. The company experience problems with the data regarding the employee turnover intention. During this process, the existing human resources have not been able to map the factors and reasons for turnover in the company due to the company does not yet have a clear assessment as a reference for calculating the fulfillment of individual employee needs.

These problems occur due to the formation of the human resource department in early 2022, three years since the establishment of the PT Kolaborasi Edukasi Nusantara in 2019. Human resource management is needed by companies to make managerial decisions, especially related to human resources so that they can achieve the company's strategic goals and prevent employee turnover [7][8]. The effect of the turnover intention in the organization can lead to more difficulties to work on the project, creating multiple jobs, and the dissatisfaction of employees that can affect the company image. Thus, turnover will be a problem that can have an impact on the loss of potential human resources and increased company costs.

According to Morgan & Goldsmith [9], employee experience is the term that is designed for employees, or where the organization believes that it is what employee reality should be like. In addition, employee experience can also be defined as the exchange of employee expectations, needs, and wants and the organizational design of employee expectations, needs, and wants. It was found companies that implement employee experience will produce a 40% lower turnover rate than other companies.

The physical environment relates to the conditions in which employees work and the overall office environment. An excellent physical environment will act as a positive symbol and representation of the company, whereas a bad

physical environment will negatively affect employees. According to Applebaum et al. [10], the physical environment can affect the level of job satisfaction and can ultimately trigger turnover intention.

Any technology that can help employees get the job done is part of the technological environment. It can be anything, in the form of software or hardware. Technology is something that can help the future of work and employee experience [9]. Employees tend to leave their current jobs is correlated to the problem of technology that is not yet qualified in the company. Employees will feel very frustrated with the tools they use to get the job done.

Corporate culture is defined by how employees are treated, products and services are trained, collaboration is established, and employees can complete their work [9]. Kumar & Yacob [11] in their research stated that the organizational culture will affect turnover intention. When employees accept a high corporate culture, the turnover intention will be negatively proportional, which means it will be low.

Employee turnover intention is a very important problem in the field of Human Resource Management [11]. High employee turnover becomes a great and continuous problem for the company. Gawali [12] also stated that employee turnover causes a decrease in motivation and low morale.

A set of hypotheses was constructed based on the framework and used in this study.

H1: There is a negative and significant relationship between Employee Experience and Turnover Intention.

H2: There is a negative and significant relationship between Physical Environment and Turnover Intention.

H3: There is a negative and significant relationship between Technological Environment and Turnover Intention.

H4: There is a negative and significant relationship between Cultural Environment and Turnover Intention.

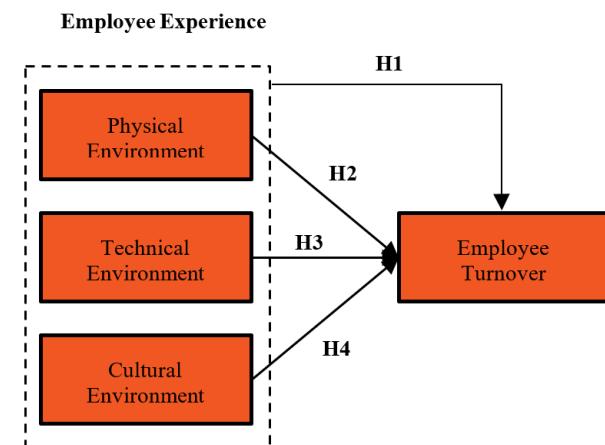


Fig. 1. Conceptual Framework

II. METHODOLOGY

The researcher conducted by using the mixed-method research approach. A quantitative approach to explore the relationship between variables to run a hypothesis. In this research, the researcher will use a questionnaire to gather the data needed. This questionnaire will use a 5-item scale where participants will answer with a 5-point Likert continuum from 1 (strongly disagree) to 5 (strongly agree) following the studies that have been formed. A random sampling method was also formed to determine the questionnaire. For the data analysis, it will use descriptive and regression analysis to conduct the analysis and dig deeper into the data obtained.

The qualitative approach used to be able to validate the results of research conducted on the quantitative approach. In this research, the researcher used an interview method to gather the data needed. The interview in this research will be conducted using the semi-structured interview method. Judgment or purpose sampling was chosen in this semi-structured interview because it began with a purpose in mind and the sample was therefore chosen to include those of interest, and exclude those who were unfit for the purpose [13]. For the data analysis, the researcher uses coding that marks and categorizes data to identify various themes and their associations [14].

III. RESULTS

A. Quantitative Method

Validity Test & Reliability Test Result

Based on the findings of the validity test, all research instruments have been calculated and found that the r-count is greater than the r-table at the time the significance level is 5% n=49, namely 0.2759. It can be concluded that the 37 existing instruments are valid and can be used as a research measure.

Table 1 - PHYSICAL ENVIRONMENT VALIDITY TEST RESULT

Instrument	R count	R table	Result
PE1	0,577008568	0,2759	Valid
PE2	0,486473429	0,2759	Valid
PE3	0,650325617	0,2759	Valid
PE4	0,602299134	0,2759	Valid
PE5	0,57600924	0,2759	Valid
PE6	0,339635223	0,2759	Valid
PE7	0,610230234	0,2759	Valid
PE8	0,633869739	0,2759	Valid
PE9	0,641809898	0,2759	Valid
PE10	0,651727472	0,2759	Valid
PE11	0,560224148	0,2759	Valid
PE12	0,300895659	0,2759	Valid
PE13	0,552054389	0,2759	Valid
PE14	0,423650155	0,2759	Valid
PE15	0,546988613	0,2759	Valid

Table 2 - TECHNOLOGICAL ENVIRONMENT VALIDITY TEST RESULT

Instrument	R count	R table	Result
TE1	0,778417727	0,2759	Valid
TE2	0,833799857	0,2759	Valid
TE3	0,883935591	0,2759	Valid
TE4	0,775832076	0,2759	Valid

Table 3 - CULTURAL ENVIRONMENT VALIDITY TEST RESULT

Instrument	R count	R table	Result
CE1	0,787415776	0,2759	Valid
CE2	0,896814196	0,2759	Valid
CE3	0,816408622	0,2759	Valid
CE4	0,826026579	0,2759	Valid
CE5	0,89054598	0,2759	Valid
CE6	0,794051715	0,2759	Valid
CE7	0,631398095	0,2759	Valid
CE8	0,787600325	0,2759	Valid
CE9	0,770515416	0,2759	Valid

Table 4 - TURNOVER INTENTION VALIDITY TEST RESULT

Instrument	R count	R table	Result
TI1	0,849278613	0,2759	Valid
TI2	0,829522401	0,2759	Valid
TI3	0,809338532	0,2759	Valid
TI4	0,902038788	0,2759	Valid
TI5	0,73218357	0,2759	Valid
TI6	0,854299642	0,2759	Valid
TI7	0,852374249	0,2759	Valid
TI8	0,848361286	0,2759	Valid
TI9	0,862687175	0,2759	Valid

A reliable questionnaire instrument is if the results of Cronbach's Alpha are above 0.6. Based on the data analysis, Physical Environment has Cronbach Alpha of 0.825, Technological Environment of 0.834, Cultural Environment of 0.930, and Turnover Intention of 0.944. Therefore, the data collected in the questionnaire are considered reliable.

Table 5 - RESEARCH VARIABLE REABILITY TEST RESULT

No	Variable	Cronbach's Alpha	N of Items
1	Physical Environment	0,825	15
2	Technological Environment	0,834	4
3	Cultural Environment	0,930	9
4	Turnover Intention	0,944	9

Simple and Multiple Linear Regression

In this research, 4 models will be analyzed in the SLR and MLR. The first model has an independent variable Employee Experience, the second model is independent of the Physical, Technological, and Cultural variables, and the third and fourth models with additional control variables from the first and second models.

Model 1

Based on the table below, 50.8% of turnover intention can be described by employee experience, while the other 49.2% is influenced by other variables outside the study.

Table 6 - R-SQUARE TEST MODEL 1

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,720 ^a	0,518	0,508	6,485
a. Predictors: (Constant), EE				

The table below shows that the significant level is below 0.05, thus proving that employee experience has a significant relationship with turnover intention.

Table 7 - F-SIGNIFICANT TEST MODEL 1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2128,304	1	2128,304	50,602	0,000 ^b
	Residual	1976,798	47	42,06		
	Total	4105,102	48			
a. Dependent Variable: TI						
b. Predictors: (Constant), EE						

This data is also proven in the partial test (t-test) which has the following results.

Table 8 - T-Significant Test Model 1

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1	(Constant)	69,372	6,815		10,18	0
	EE	-0,451	0,063	-0,72	7,114	0
a. Dependent Variable: TI						

In the table, it is proven that the significant level is also below 0.05 and the t-count (7.114) > t-table (2.0096)

Table 9 - REGRESSION EQUATION MODEL 1

Model		Coefficients ^a	
		Unstandardized Coefficients	Beta
1	(Constant)	69,372	6,815
	EE	-0,451	0,063
a. Dependent Variable: TI			

By entering into the simple regression model formula, the results of model 1 are obtained as follows:

$$\text{Model 1:} \\ \mathbf{Y = 69.372 - 0.451X1}$$

Based on the results of the above formula, it can be concluded that:

1. a is a constant coefficient value of 69.372. This shows that if employee experience is 0, then turnover intention is 69.372.
2. Assuming employee experience (X_1) is fixed (unchanged), then every 1 unit increase in employee experience will reduce turnover intention by 0.451.

Model 2

The results of the coefficient of determination model 2 are as follows.

Table 10 - R-SQUARE TEST MODEL 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,765 ^a	0,585	0,557	6,152
a. Predictors: (Constant), CE, TE, PE				

Based on the table above, it can be concluded that the physical, technological, and cultural environment can be explained by a turnover intention of 55.7%, while the other 44.3% are influenced by other variables outside the study.

Table 11 - F-SIGNIFICANT TEST MODEL 2

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2401,95	3	800,649	21,154	0,000 ^b
	Residual	1703,16	45	37,848		
	Total	4105,1	48			
a. Dependent Variable: TI						
b. Predictors: (Constant), CE, TE, PE						

The table above shows that the significant level is below 0.05, thus proving that the physical, technological, and cultural environment simultaneously or together has a significant relationship with turnover intention. However, this can be disputed at the results of the partial test (T Test) below.

Table 12 - T-SIGNIFICANT TEST MODEL 2

Model		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
1	(Constant)	65,039	6,722		9,675	0
	PE	-0,071	0,182	-0,058	-0,39	0,699
	TE	-0,407	0,51	-0,108	0,798	0,429
	CE	-0,925	0,192	-0,653	4,807	0
a. Dependent Variable: TI						

In the table, it is shown that the significant level below 0.05 is only in the cultural environment and t-count (4.807) > t-table (2.0096). Meanwhile, in the physical and technological environment, the significant level is above 0.05 and the t-test (0.798 and -0.39) < t-table (2.0096)

Table 13 - REGRESSION EQUATION MODEL 2

Model		Coefficients ^a	
		Unstandardized Coefficients	
1	(Constant)	B	Std. Error
	(Constant)	65,039	6,722
	PE	-0,071	0,182
	TE	-0,407	0,510
	CE	-0,925	0,192

By entering into the multiple regression model formula, the results of model 2 are obtained as follows:

$$\text{Model 2:} \\ \mathbf{Y = 65.039 - 0.071X1 - 0.407X2 - 0.925X3}$$

Description:

X1 = Physical Environment (PE)

X2 = Technological Environment (TE)

X3 = Cultural Environment (CE)

Based on the results of the above formula, it can be concluded that

1. a is a constant coefficient value of 65.039. This shows that if the physical, technological, and cultural environment are 0, the turnover intention is 65.039.
2. In the physical environment (X_1) assuming the value is fixed (unchanged), then every 1 unit increase in the physical environment will reduce turnover intention by 0.071. However, this can not be used as a reference because t shows that the physical environment variable does not have a significant effect on the employee turnover intention.
3. In the technological environment (X_2) assuming the value is constant (unchanged), then every 1 unit increase in the technological environment will decrease turnover intention by 0.407. However, this cannot be used as a reference because t shows that the technological environment variable has no significant effect on the employee turnover intention.
4. However, it is different from the cultural environment (X_3) where assuming it has a fixed value (unchanged), then every 1 unit increase in the cultural environment will reduce turnover intention by 0.925.

Model 3

Multi-linear regression analysis with control variables was also used to see the robustness of the research results. The results of the coefficient of determination model 3 are as follows.

Table 14 - R-SQUARE TEST MODEL 3

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,741a	0,549	0,471	6,723
a. Predictors: (Constant), Length of Work, Intern/Contract, EE, Male, Lead, Age, C-Level/VP				
b. Dependent Variable: TI				

Based on the table above, 47.1% of turnover intentions can be described by employee experience, while the other 52.9% is influenced by other variables outside the study.

Next, a simultaneous test (F test) will be conducted to determine whether all independent variables affect the dependent variable. If the significant level is <0.05 , it can be concluded that the independent variable jointly influences the dependent variable.

Table 15 - F-SIGNIFICANT TEST MODEL 3

		ANOVA ^a				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2251,87	7	321,695	7,117	0,000 ^b
	Residual	1853,24	41	45,201		
	Total	4105,1	48			

a. Dependent Variable: TI
b. Predictors: (Constant), Length of Work, Intern/Contract, EE, Male, Lead, Age, C-Level/VP

The table above shows that the significant level is below 0.05, thus proving that employee experience has a significant relationship with turnover intention. This data is also proven in the partial test (t-test) which has the following results.

Table 16 - T-SIGNIFICANT TEST MODEL 3

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	74,372	9,984		7,449	0
	EE	-0,442	0,075	-0,707	5,883	0
	C-Level/VP	-0,529	6,738	-0,011	0,079	0,938
	Intern/Contract	-4,363	3,682	-0,131	1,185	0,243
	Lead	1,59	3,213	0,061	0,495	0,623
	Male	1,55	2,149	0,085	0,721	0,475
	Age	-0,233	0,376	-0,08	-0,62	0,539
	Length of Work	-0,074	0,19	-0,067	0,391	0,698

a. Dependent Variable: TI

In the table, it is proven that the significant level of employee experience is also below 0.05 and t-count (5.883) > t-table (2.0096). Model 3 also shows that there is no significant control variable on turnover intention because the significant level of each control variable is above 0.05.

Table 17 - REGRESSION EQUATION MODEL 3

Model		Coefficients ^a	
		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	74,372	9,984
	EE	-0,442	0,075
	C-Level/VP	-0,529	6,738
	Intern/Contract	-4,363	3,682
	Lead	1,59	3,213
	Male	1,55	2,149
	Age	-0,233	0,376
	Length of Work	-0,074	0,19

a. Dependent Variable: TI

By entering into the multiple regression model formula, the results of model 3 are obtained as follows:

Model 3:

$$Y = 74.372 - 0.442X_1 - 0.529CV - 4.363IC + 1.59L \\ + 1.55G - 0.233U - 0.074LW$$

Description:

X_1 = Employee Experience (EE)

CV = C-Level/VP

L = Lead

U = Age

IC = Intern/Contract

G = Gender (Male)

LW = Length of Work

Based on the results of the above formula, it can be concluded that

1. a is a constant coefficient value of 74,372. This shows that if employee experience is 0, then turnover

intention is 74,372.

2. Assuming employee experience (X_1) is fixed (unchanged) then every 1 unit increase in employee experience will reduce turnover intention by 0.442.

Table 18 - MODEL REGRESSION SUMMARY

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,720 ^a	0,518	0,508	6,485
3	0,741a	0,549	0,471	6,723

From the results of the regression summary model table, it can be concluded that the addition of control variables in model 3 shows weakens in the regression model. This is indicated by the adjusted R square value which decreased from 0.508 to 0.471. And by adding these variables, the core variable is still significant on turnover intention with an error rate of 5%. This shows that the regression model is a robust model.

Model 4

The results of the coefficient of determination model 4 are as follows.

Table 19 - R-SQUARE TEST MODEL 4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,778 ^a	0,605	0,514	6,445

a. Predictors: (Constant), Length of Work, TE, Male, Lead, Intern/Contract, Age, C-Level/VP, CE, PE
b. Dependent Variable: TI

Based on the table above, it can be concluded that the physical, technological, and cultural environment can be explained by turnover intention of 51.4%, while the other 48.6% are influenced by other variables outside the study.

Next, a simultaneous test (F test) will be conducted to determine whether all independent variables affect the dependent variable. If the significant level is <0.05, it can be concluded that the independent variable jointly influences the dependent variable.

Table 20 - F-SIGNIFICANT TEST MODEL 4

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2484,872	9	276,097	6,646	0,000 ^b
	Residual	1620,231	39	41,544		
	Total	4105,102	48			

a. Dependent Variable: TI
b. Predictors: (Constant), Length of Work, TE, Male, Lead, Intern/Contract, Age, C-Level/VP, CE, PE

The table above shows that the significant level is below 0.05, thus proving that the physical, technological, and cultural environment simultaneously or together has a significant relationship with turnover intention. However, this can be disputed if you look at the results of the partial test (T Test) below.

Table 21 - T-SIGNIFICANT TEST MODEL 4

Model		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
1	(Constant)	72,524	9,672		7,498	0
	PE	-0,05	0,202	-0,041	0,246	0,807
	TE	-0,496	0,601	-0,132	0,825	0,414
	CE	-0,902	0,231	-0,636	-3,9	0
	C-Level/VP	3,048	6,755	0,066	0,451	0,654
	Intern/Contract	-2,913	3,87	-0,087	0,753	0,456
	Lead	1,474	3,128	0,056	0,471	0,64
	Male	0,978	2,095	0,053	0,467	0,643
	Age	-0,309	0,363	-0,106	0,852	0,399
	Length of Work	-0,098	0,188	-0,088	0,521	0,605

a. Dependent Variable: TI

In the table, it is shown that the significant level below 0.05 is only in the cultural environment and t-count (3.9) > t-table (2.0096). Meanwhile, in the physical and technological environment, the significant level is above 0.05 and the t-test (0.246 and 0.825) < t-table (2.0096). Model 4 also shows that there is no significant control variable on turnover intention because the significant level of each control variable is above 0.05.

Table 22 - REGRESSION EQUATION MODEL 3

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	72,524	9,672
	PE	-0,050	0,202
	TE	-0,496	0,601
	CE	-0,902	0,231
	C-Level/VP	3,048	6,755
	Intern/Contract	-2,913	3,870
	Lead	1,474	3,128
	Male	0,978	2,095
	Age	-0,309	0,363
	Length of Work	-0,098	0,188

By entering into the multiple regression model formula, the results of model 4 are obtained as follows:

Model 4:

$$Y = 72.524 - 0.050X_1 - 0.496X_2 - 0.902X_3 + 3.048VP - 2.913IC - 1.474L + 0.978G - 0.309U - 0.098LW$$

Description:

X1 = Physical Environment (PE)

X2 = Technological Environment (TE)

X3 = Cultural Environment (CE)

CV = C-Level/VP IC = Intern/Contract

L = Lead G = Gender (Male)

U = Age LW = Length of Work

Based on the results of the above formula, it can be concluded that

1. a is a constant coefficient value of 72.524. This shows that if the physical, technological, and cultural environment are 0, the turnover intention is 72.524.
2. In the physical environment (X1), assuming this value is fixed (unchanged), then every 1 unit increase in the physical environment will reduce turnover intention by 0.050. However, this cannot be used as a reference because t shows that the physical environment variable does not have a significant effect on the employee turnover intention.
3. In the technological environment (X2), assuming the value is constant (unchanged), then every 1 unit increase in the technological environment will decrease turnover intention by 0.496. However, this cannot be used as a reference because t shows that the technological environment variable has no significant effect on the employee turnover intention.

4. However, it is different from the cultural environment (X3) where assuming it has a fixed value (unchanged), then every 1 unit increase in the cultural environment will decrease turnover intention by 0.902.

Table 23 - MODEL REGRESSION SUMMARY

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	0,765 ^a	0,585	0,557	6,152
4	0,778 ^a	0,605	0,514	6,445

From the results of the regression summary model table, it can be concluded that the addition of control variables in model 4 indicates weakens in the regression model. This is indicated by the adjusted R square value which decreased from 0.557 to 0.517. And by adding the control variable, the final result of the analysis of the two is still the same. This shows that the regression model is a robust model.

The table below shows the results of the hypothesis testing.

Table 24 - MODEL REGRESSION SUMMARY

Hypotheses		Result
H1	There is a negative and significant relationship between employee experience (EE) and turnover intention (TI).	Accepted
H2	There is a negative and significant relationship between physical environment (PE) and turnover intention (TI).	Rejected
H3	There is a negative and significant relationship between technological environment (TE) and turnover intention (TI).	Rejected
H4	There is a negative and significant relationship between cultural environment (CE) and turnover intention (TI).	Accepted

From these results, it can be seen that the independent variables that have a negative and significant relationship to turnover intention are Employee Experience simultaneously and Cultural Environment. Meanwhile, the independent variable physical and technological environment has no negative and insignificant relationship to the turnover intention of PT Kolaborasi Edukasi Nusantara.

B. Qualitative Method

In conducting research using this qualitative method, the researcher found data that the respondents interviewed 4 people served as leads of a division and 4 other people

were full-time staff. Each of the existing respondents has also worked for more than 6 months at PT Kolaborasi Edukasi Nusantara. So it can be said that this data is valid because it has met the criteria that have been set previously. In addition, the respondents who were interviewed were 5 women and 3 men.

Physical Environment

Based on the results of interviews conducted by researchers with the interviewees, the physical environment at PT Kolaborasi Edukasi Nusantara gives rise to various opinions that differ from one another. As the description provided by the interviewees, the demographics of employees at PT Kolaborasi Edukasi Nusantara have an age range of under 30 years, so they are still young and easy to adapt to one another. The interviewees also added that the PT Kolaborasi Edukasi Nusantara office is located in a complex area that is a bit far from the main highway. This condition makes employees less disturbed by street noise because several divisions work indoors. This is shown by several statements by Ms. KS and Mr. BI regarding their division which is given their room. Ms. NT and Mr. EA also mention that the office form is more likely home and an open workspace so that divisions can face each other also creates a working environment that is tolerant and can get to know each other from different divisions.

However, different opinions were also given by other respondents. Due to the open form of the office, Ms. IF believes that often at certain hours the situation become not conducive.

New problems also arise when the company continues to grow and recruit more employees. Ms. AN mentioned that some people find it difficult to concentrate in a large room because there are discussions and conversations. The number of chairs and tables is also increasingly limited due to the increase in human resources, so a hybrid system is formed where employees take turns rolling to go to the office. Supported by Ms. KS, where Vokraf's office is also increasingly inadequate. Ms. NT also mentioned that the design of the office owned by PT Kolaborasi Edukasi Nusantara has a theme of industrial gray, even though the message of being a creative industry company has not been conveyed. However, according to her, this is not a big obstacle because she feels more comfortable with the people in it than with PT Kolaborasi Edukasi Nusantara's physical condition.

Technological Environment

Based on the results of interviews obtained from 8 interviewees, was found that PT Kolaborasi Edukasi Nusantara provides appropriate technology to each of its

employees. Every employee who has passed the probation to become a full-time staff will be allowed to get laptop technology to support their work in the office. According to Mr. IB himself, every employee in his division that currently actively working also gets a monitor screen that can help with their work. Besides, Ms. NT also mentioned that in his current division, due to communication with various external parties, such as customers, they also get technological facilities in the form of cellphones. Every employee who is in PT Kolaborasi Edukasi Nusantara also has an age range under 30 years, so it is not difficult for them to be able to adapt to all new technologies in the office. During the pandemic and carrying out the work from the home process, every employee can easily use the Google Meet and Zoom services to conduct meetings and pitch.

Cultural Environment

When the researcher asked about how PT Kolaborasi Edukasi Nusantara works, most of the interviewees answered that the company prioritizes achievement-oriented toward its employees. Employees also feel that their work is flexible because there are no written standard rules that must be adhered to such as the use of clothes, hours of work, which are commonly found in corporate and state-owned companies. According to the interviewees, PT Kolaborasi Edukasi Nusantara has a relaxed work culture, flexible communication, democracy, and mutual support between one another, as superiors and colleagues. Every superior and subordinate is open to criticism, input, and suggestions. They also support each other and help each other when experiencing obstacles or difficulties. Every existing employee also creates a work environment that is friendly to one another. In the process, several divisions also conduct one-to-one sessions to evaluate each other and provide input between superiors and staff so that each work done can be continuously developed every week.

Morgan [9] said that the cultural environment is a side effect of working in a company. So that it can be interpreted as a feeling when employees can work for the company or the leader. In this case, each interviewee gave a different response from one another. Ms. KS in the interview felt a pleasant side effect. Mr. BI felt safe and more than what he imagined. Sometimes he feels unhappy when his workload is too much or there is no work at all. But in the end, he had no problem with it.

Another story was also given by Ms. IF, where she feels happy because of the openness between each other's criticism of superiors and co-workers. Ms. RP, Ms. AN, and Ms. NT also added that they find it exciting to be in a workplace where the age range is not too far from each other. They feel motivated to see the role of young people

in the creative industry. So far, they feel that working at PT Kolaborasi Edukasi Nusantara is as expected, even though they often feel busy and congested. Mr. EA also gave his opinion that he felt happy because he felt that it suited the work atmosphere of young people so that he saw a lot of things that could be learned. Related to the story of Mr. RF where having a workmate is very fun because they can discuss and laugh with each other.

Turnover Intention

Based on the interview result, if the respondents were asked about their desire to be able to develop themselves elsewhere, some interviewees who have been above 1 year at PT Kolaborasi Edukasi Nusantara said that they prefer to be able to develop the company to be the best. This is evident from the statements of Ms. KS, Ms. AN, and Ms. NT feels that there is still a lot that wants to be explored more deeply about the company. While Mr. IB argues that if he feels bored with his current job, he overcomes this by looking for exciting things outside (external) such as freelance or deepening his skills.

However, some opinions were also given by other interviewees regarding the intention to be at PT Kolaborasi Edukasi Nusantara. Ms. IF believes that there is a desire to go out and question whether the field she is currently working on is a job he has wanted to do for a long time. A similar opinion was also given by Mr. RF who once questioned whether he should leave the company. But he again thought about the factors that made him not want to go out. So far, although he has quite a lot of work, he also enjoys it so much that he still goes to the office.

Another opinion was also given by Ms. RP and Mr. EA, where they once felt bored and made them lazy to work. They think the intention to leave will occur when they get something better outside the company. If work emotions are unstable, then often the urge to see other opportunities out there will occur. Ms. NT also mentioned that there are still many things that can be explored out there, so she wants to plan what the future will be like.

Mr. IB also said that while he was at PT Kolaborasi Edukasi Nusantara, he had not found anything exciting in doing his job. The team also doesn't know what the future goals will be, seeing the company's main focus is the development of the Kelas Prakerja. When the Kelas Prakerja is reached, there will be no further goals that can be achieved. According to Mr. IB, this can not only be initiated by his team but should be initiated holistically and thoroughly with other divisions. PT Kolaborasi Edukasi Nusantara is still looking for its color in this regard. Supported by the opinion of Ms. AN where she still hopes that fellow employees have the same vision, namely to advance the company so that in the future, PT Kolaborasi Edukasi

Nusantara can continue to survive and present innovations

IV. DISCUSSION

This research was conducted to find out the factors from employee experience that cause turnover intention at PT Kolaborasi Edukasi Nusantara. The researcher will discuss in more detail the results of the study by using triangulation data that has been obtained through questionnaires and semi-structured interviews.

Hypothesis 1. Employee Experience has a negative and significant relationship to Turnover Intention in PT Kolaborasi Edukasi Nusantara

Based on the data obtained from the quantitative approach, employee experience simultaneously has a negative and significant relationship with the turnover intention of PT Kolaborasi Edukasi Nusantara. This is in line with IBM and Globoforce [15] which stated that with a positive employee experience, will lead to trust and belief in the company, the relationship between employees, recognition, feedback, empowerment, and voice within the company, as well as work-life balance of employees to the company so that there is a decrease in turnover intention. Morgan [9] also proves in his book that companies that implement employee experience will produce a 40% lower turnover rate than other companies.

Supported by the result of the interview, employees at PT Kolaborasi Edukasi Nusantara are currently satisfied, don't mind the current office conditions and situation, feel that the facilities provided are good enough, can work flexibly, and are open to criticism and suggestions from one another. However, PT Kolaborasi Edukasi Nusantara still has to be able to improve some parts that employees feel are lacking and make them want to look for new and bigger opportunities elsewhere. Some employees feel they haven't seen a long-term opportunity here, there is no big purpose yet. the company wants to bring, employees who do not share the same vision, as well as limited tables and chairs for employees. Therefore, human resources must be able to improve this situation.

Hypothesis 2. Physical Environment does not have a negative significant relationship to Turnover Intention in PT Kolaborasi Edukasi Nusantara

Based on the data, the physical environment does not have a negative and significant relationship with turnover intention. From the result, it can be seen that although physical can affect turnover intention, employees who are exposed to extreme physical conditions will have a greater impact on employee turnover intention [16]. Other studies have also shown that there are no direct effects on different perceptions of the work environment

and turnover intention. Employee turnover intention is not directly related to the perception of elements of the work environment such as work layout, air circulation, lighting, equipment, and furniture [17]. Van Meel [18] also stated that currently with the development of technology, every employee can work anywhere and anytime. So this makes every employee able to have when and where they want to work depending on the task given [19]. The questionnaire distributed to employees of PT Kolaborasi Edukasi Nusantara also indicated that currently they are quite satisfied with the current physical condition of the office. However, this does not mean that this should not be considered, it must be improved in the future to minimize the occurrence of turnover intention.

Supported by the opinion given by respondents through semi-structured interviews, the researcher can see a pattern where the physical condition of the office where the employee is currently working does not make employees want to leave the company. At first, some of the employees felt disturbed due to the open workspace with other divisions, but as time goes on, they increasingly find solutions or ways to overcome these problems. Like Mr. RF sometimes overcomes it by using headphones and Mr. EA looking for a quiet place when doing a meeting or pitching. These data conducted certainly become an input that can be used by the management of PT Kolaborasi Edukasi Nusantara in the future in maintaining and developing the company's physical environment.

Hypothesis 3. Technological Environment does not have a negative significant relationship to Turnover Intention in PT Kolaborasi Edukasi Nusantara

However, based on the result of the researcher, it is shown that there is no relationship between technological environment and turnover intention. Therefore, the results of this study do not align with the results obtained from Morgan (2017) regarding the relationship between technological environment and turnover intention.

The results of the interviews conducted can help support the results of the questionnaire on the use of existing technology at PT Kolaborasi Edukasi Nusantara. The company provides laptop facilities, email domains, and several tools to the employees. However, employees themselves can choose whether they want to take it or not. Just like a monitor screen that is given only to the tech team and a smartphone that is given to the customer service team. The use of these technologies back to the needs of each employee. Employees do not feel that the presence of this technology makes them want to leave or continue to be in the company. The data obtained will certainly be input to the management of PT Kolaborasi Edukasi Nusantara in maintaining and evaluating its technological environment.

Hypothesis 4. Cultural Environment has a negative and significant relationship to Turnover Intention in PT Kolaborasi Edukasi Nusantara

Based on the data obtained from the quantitative method, the cultural environment has a negative and significant relationship with turnover intention in PT Kolaborasi Edukasi Nusantara. According to Pallock (1969) organizational culture has an impact on employee retention. If the organizational culture is positive, then employees will stay and not leave their jobs and be loyal. In contrast, if the organizational culture is negative, it causes high turnover intention. Yacob [11] in his research also stated that the organizational culture will affect turnover intention. Morgan [9] explained that culture is 40% of the total employee experience. The data shows that the cultural environment has the biggest relationship among others in decreasing turnover intention.

From the interview results, the researcher can conclude that the cultural environment provided by PT Kolaborasi Edukasi Nusantara in the form of openness, flexibility, relaxed work, democracy, and achievement-oriented also gives a good side effect to each employee. Proved by a positive work environment, every employee feels happy, according to expectations, thus facilitating discussions of constructive criticism and suggestions between each other. However, management ought not to neglect this culture. Most interviewees began to wonder if in the future they saw a great opportunity to grow at PT Kolaborasi Edukasi Nusantara. They also feel that they have not yet found a major purpose for the company to move. Each employee still has a different vision and has not shown its true potential. The results of the interview will also be used and given to maintain and evaluate the company's cultural environment.

V. CONCLUSION

The researcher conducted this research to identify the problem regarding the physical, technology, and cultural environment that leads to the possible turnover intention in PT Kolaborasi Edukasi Nusantara. This study uses quantitative and qualitative methods by distributing questionnaires and conducting interviews, and processing them using single and multi-linear regression and coding.

Based on 49 respondents who are currently actively working at PT Kolaborasi Edukasi Nusantara, it was found that employee experience and cultural environment have a negative and significant relationship to turnover intention. The data supported by the research conducted by Morgan [9] dan Yacob [11]. Meanwhile, physical and technological have no negative and significant relationship with turnover intention. The data also supported by research conducted by Layne [16]. Semi-structured interviews were

also conducted with 8 resource persons from different positions and divisions.

Based on the results, the researcher saw the similarity between the data from quantitative and qualitative methods. Thus, the results of the questionnaire and semi-structured interviews that have been conducted are valid to determine the factors of employee experience and turnover intention at PT Kolaborasi Edukasi Nusantara. With this, it intends that PT Kolaborasi Edukasi Nusantara can improve and enhance employee experience in order to minimize turnover intention.

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Paper 76

The Perception Of Upstream Oil And Gas Employees
Concerning The Readiness In Change Management To
Face The Energy Transition Case Study PT. PHI

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract – The world is changing, human as a ruler in this planet start to see the needs of earth conservation. The green energy movement will affect oil and gas company as the result of commitment to reduce the Carbon level in the air. Some research regarding the future consumption of fossil fuel are quite surprising that in the near future the usage of fossil fuel expected to extremely decline due to utilization of new and renewable energy source in daily life. As an impact, Oil price estimated to decrease drastically in the future because of decrease in fossil fuel demand, therefore this condition lead to some thoughts about going concern and the sustainability of the oil and gas company and also the impact to the job security for oil and gas upstream personnel.

This research conduct to explore and digging the readiness of the company and personnel from the point of view of upstream personnel in facing energy transition. Employee must be equipped with the latest knowledge and information about energy transition, personnel mobility to the new and renewable affiliates will provide great experience to prepare the upstream employee to be ready for the Energy Transition Period.

Keywords – Energy Transition; The future of Oil and Gas Upstream Business; Upstream Personnel Perspective; Employee empowerment.

I. INTRODUCTION

The energy transition has recently become a topic that has attracted the attention of all peoples in the world; this is due to a change in the mind-set of world citizens regarding energy needs that are generated from cleaner, more sustainable sources that come from renewable energy sources. Paris Agreement is a major commitment from all countries in the world in facing global climate change, which is getting worse. Currently fossil fuel is one of the factors that have been blamed for the worsening global climate conditions. However, global energy needs still rely heavily on fossil fuels. Countries in Europe are starting to think about steps towards cleaner energy. Regulations and initiatives from the private sector have supported these movements towards better energy. For example BP Net Zero Initiatives. In contrast to the continents of America and Asia the use of fossil energy, still become main priority in the energy mix. When we are talk about energy demand in Indonesia we can see government plan on the energy mix still rely on fossil fuel.

Some research regarding the future consumption of fossil fuel are quite surprising that in the near future the usage of fossil fuel expected to drastically decline due to utilization of new and renewable energy source in daily life.

Oil price expected to be dropped in the future because of decrease in fossil fuel demand, therefore this condition lead to some thoughts about going concern and the sustainability of the company.

The world is changing, human as a ruler in this planet start to see the needs of earth conservation. Some of research told us about the deteriorating of environment in this planet. Modernization leads to use of huge amount of fossil fuel as the main source of energy in the last decade. This have an impact in the increase of planet temperature and leads to the changing in the global climate. Nowadays people think to find green energy sources, which has a very minimum damage to the environment. The movement will affect oil and gas company as the result of commitment to reduce the Carbon level in the air. This research conduct to have a clear perspective from the upstream personnel in facing the new era of energy.

This paper presents results of a research assessing the company and personnel readiness facing energy transition period in upstream energy sector and aim to answer these research questions :

1. Based on change management model, how do upstream personnel understand regarding the acceleration of energy transition currently?
2. To what extent is the Company ready to enter the energy transition period? What strategic actions have been taken so far?
3. What are the main findings on the change management model regarding the readiness of upstream personnel to face the energy transition?

II. LITERATURE REVIEW

ADKAR is an acronym for the five sequential steps that the individual needs to go through in order for any change to be successful (Hiatt, 2006). Prosci Research (2004) argue that while the organization is following the three phases of organizational change in relation to the organizations objectives, which include preparing for the

change, managing the change and reinforcing the change, it is important that the preparedness is assessed from the employee's point of view.

A- Awareness of the need for change The ADKAR model proposes that understanding why change is necessary is the first key aspect of successful change. Hiatt (2006) argues that this step in the ADKAR change model explains the reasoning and thought processes that underlies a required change.

D- Desire to participate in and support the change The desire to change concerns an understanding on the part of the change participant on how the proposed change is going to impact him/her (Hiatt, 2006)

K - Knowledge on how to change the third element of the change readiness assessment model relates to the change participants knowledge about the change. More specifically, it is the understanding by the change participant as to what knowledge is required by him/her due to the change.

A- Ability to perform during and after the change Hiatt (2006) argues that it is not just the theoretical knowledge of the change that needs to be assed but the ability of the change participant to perform the change.

R - Reinforcement to sustain the change The final stage of the change readiness assessment is an understanding by the change participants as to whether the change proposed is sustainable (Hiatt, 2006).

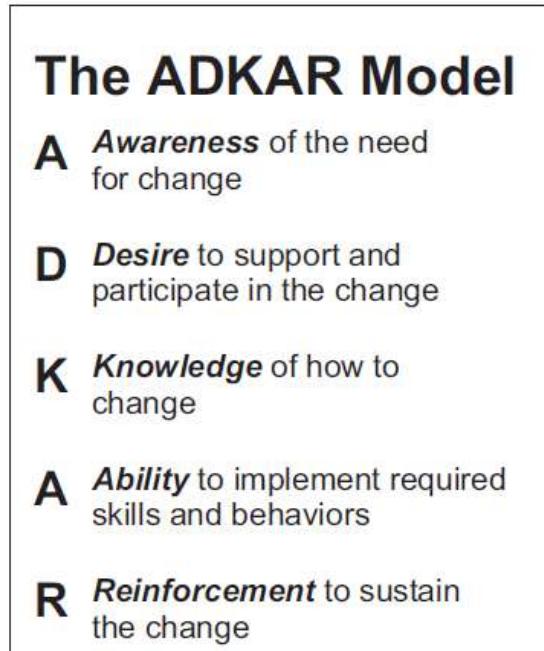


Figure 1. The ADKAR Model

III. METHODOLOGY

The author started the research by stating the business issue, deciding the research objectives and doing data collection using qualitative and quantitative analysis approach, the author trying to align internal analysis (using VRCN, Resources, Capabilities & Core Competencies Analysis) and external analysis (using PESTEL, Porter 5 forces model) to get a mapping of influencer to the business performance. In the other hand to collect and gather the perspective of upstream personnel, for quantitative analysis the author trying to conduct survey by distributing online questionnaire to the PT Pertamina Hulu Indonesia employees. A set of question was distributing to explore the upstream personel perspective regarding, Indonesia external analysis Requirements for Indonesia to accelerate energy transition, Company Role – PERTAMINA HULU INDONESIA GROUP - in Energy Transition and employee Readiness facing the Energy transition era. Despite this primary data, the author collect the secondary data which came from published academic journal, busines publication, reliable news and from the company annual report.

The final step of this research is check data validity and reliability. Ghozali (2009) states that the validity test is used to measure the validity or validity of a questionnaire. A questionnaire is said to be valid if the questions on the questionnaire are able to reveal something that will be measured by the questionnaire and according to Sumadi Suryabrata (2010) reliability shows the extent to which the measurement results with these tools can be trusted. The measurement results must be reliable in the sense that they must have a level of consistency and stability. After passed the test the result were put on the ADKAR framework to have a score for evaluate the company or personnel readiness. The research methodology is shown in Figure 2.

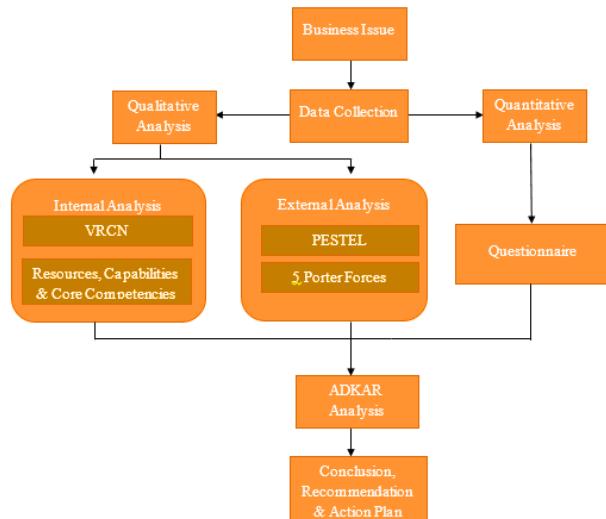


Figure 2. Research Flow Diagram

The scope of this research are the assessment to capture the understanding and / or involvement of upstream personnel in the "energy transition" and to measure the readiness of companies and personnel to face changes during the energy transition. By answering this survey, respondent are contributing to the company's continuous improvement in creating innovative leaders for the advancement of business, government and society.

The limitations of this research are this Research would focus only in PT. Pertamina Hulu Indonesia and subsidiary personnel perspective only in order to be more focus on developing a recommendation for the growth and development of the company where the authors were working. Due some time constraint, The duration of questionnaire collection are between 3rd April until 7th April 2021. Some of publication using data from 2019 due to availability of the publication sources. All the organizational and operational data using a framework before reorganization of Pertamina Upstream Subholding on April 1 2021.

IV. RESULTS AND DISCUSSION

A. Qualitative Analysis (External & Internal Analysis)

Based on PESTEL Analysis, Based on the analysis above, upstream oil and gas business is a very challenging business due to many external factors will give high impact and impose high risk for the business.. Considering post COVID19 pandemic situation which not yet over and continue to bring fear, uncertainty and doubtful because of new variants arise, the economic situation is predicted to be rebound in 2022 onward, so the customers spending will increase as well. The political stability situation in Indonesia will also support the upstream business development, especially when Indonesia are entering election period in 2024. The technology of upstream sector is another challenge for development of upstream oil and gas business, which currently are; look for any discovery in frontier and extreme environment such as deep water, enhanced oil recovery, CCUS in field rich with CO₂ content and any other advanced technology which need high capital and high competent peoples. Finally, all the regulation issued by the government of Indonesia will put huge impact on the development of new and renewable energy in Indonesia, how this regulation can keep the upstream business in the safe zone as an energy during the transition period. Government of Indonesia must support the overall upstream business value chain by releasing the supportive regulation to make the transition is running in smooth way. Based on VRCN Analysis, majority of the resources & capabilities has sustainable competitive advantage. The combination of strong reputation, exclusive rights on E&P activities, strong financial position, supported Leadership & Management,

Services Quality and excellent Project Management are become strength of PT. PHI to become world class oil and gas company. However, PT PHI must seek another opportunities and new way of working to create more sustainable competitive advantage.

B. Quantitative Analysis

The author trying to conduct survey by distributing online questionnaire to the PT Pertamina Hulu Indonesia employees. A set of question develop in three big part consist of accelerating in Indonesia, company readiness and personnel readiness was distributing to explore and digging the upstream personel perspective regarding, Indonesia external analysis Requirements for Indonesia to accelerate energy transition, Company Role - PERTAMINA HULU INDONESIA GROUP - in Energy Transition. Employee Readiness facing the Energy transition era. The questionnaire were performed using the Likert scale while the other items were asked in Guttman form (agree/disagree) and multiple choices as attached in Appendix 1. The online questionnaire was distributed through social networks from April 3, 2021 – April 7, 2021, with target respondents of 100 PT Pertamina Hulu Indonesia and subsidiaries employees to meet the recommended method of at least 100 respondents (Fraenkel et al., 2012) and sample size calculation of Slovin Formula, which is:

$$n = \frac{N}{1 + Ne^2}$$

With n = sample size, N= population, e2 = desired margin of error. In this research, the population (N) refers to the Total number of PHI employee, which was 5449 shown in table 2.1 in 2019, while the desired margin of error € is 10%. The calculation has a result of samples needed, which were 98.20 or rounded to the 100 samples. However the questionnaire in reality covered insight from 167 respondent, with 151 of them were valid. It means that the total respondent in the research were sufficient enough to continue the analysis. Respondent Profile for this survey shown in figure below :

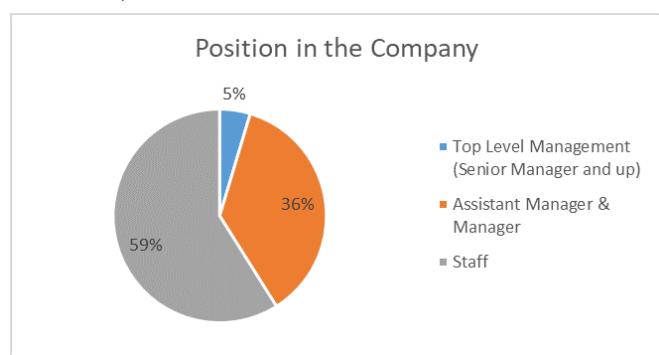


Figure 3. Position in the Company

To have an understanding about respondent profile and job level of personnel position in the organization PT. Pertamina Hulu Indonesia shown in this table 3.1 that the

respondents in this study author categorized in three group of Job Level. The results of this questionnaire state that employee working as Staff dominate this survey with 58.9%, Employee hold position as assistant manager and manager are 36.4%, and top level management represent 4.6% from the total respondent including the CEO respond to this survey.

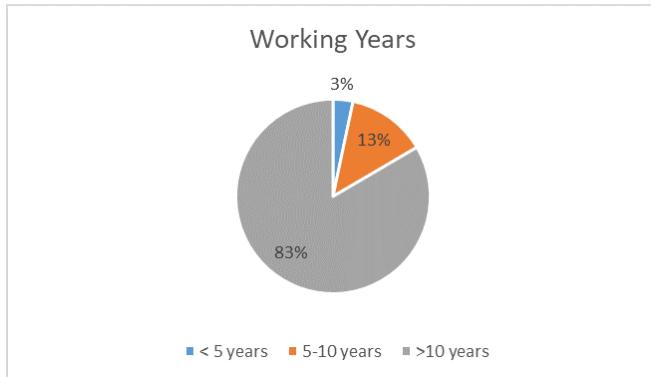
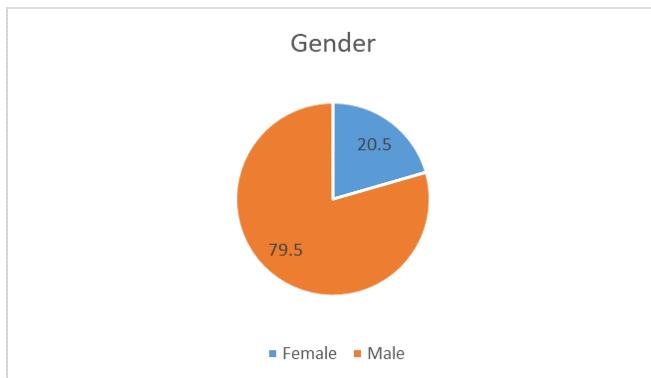


Figure 4. Working Years

To capture level of working experiences of respondents this table 3.2 explain that the respondents in this study were consist of three category working years. The results of this questionnaire state that employee working for <5 years are 3.3%, employee working for 5 – 10 years are 13.2% and around 83.4% respondents already working in this industry for more than 10 years.



This figure explain that the respondents in this study were divided into two genders, specifically male and female. The results of this questionnaire state that female respondets are 20.5% and male respondents are 79.5%.

Then author continue to check the validity and reliability of the data.

Based on the 1st calculation done using Microsoft excel, some parameter (question PHI 3 & PHI 13) must excluded must be excluded because not valid.

Table 1 Validity Test First run

No	IDN1	IDN2	IDN3	IDN4	IDN5	IDN6	IDN7	IDN8	IDN9	IDN10	IDN11	IDN12
rxy	0.33	0.29	0.34	0.19	0.20	0.44	0.18	0.36	0.41	0.33	0.40	0.46
t count	4.31	3.64	4.44	2.36	2.46	5.94	2.27	4.71	5.43	4.29	5.28	6.33
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid

Table 1 (95% 148)

1.9761

No	PHI1	PHI2	PHI3	PHI4	PHI5	PHI6	PHI7	PHI8	PHI9	PHI10	PHI11	PHI12	PHI13	PHI14	PHI15
rxy	0.33	0.32	0.16	0.35	0.17	0.22	0.35	0.43	0.38	0.41	0.38	0.37	0.01	0.36	0.22
t count	4.56	4.08	1.93	4.51	2.59	2.70	5.27	5.75	5.39	5.45	5.07	4.88	0.17	4.70	2.72
Notes	valid	valid	not valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	not valid	valid
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid

Table 1 (95% 148)

1.9761

No	PHI1	PHI2	PHI3	PHI4	PHI5	PHI6	PHI7	PHI8	PHI9	PHI10	PHI11	PHI12	PHI13	PHI14	PHI15
rxy	0.33	0.32	0.16	0.35	0.17	0.22	0.35	0.43	0.38	0.41	0.38	0.37	0.01	0.36	0.22
t count	4.56	4.08	1.93	4.51	2.59	2.70	5.27	5.75	5.39	5.45	5.07	4.88	0.17	4.70	2.72
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	not valid	valid
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid

Table 1 (95% 148)

1.9761

Rerun done using Microsoft excel, some parameter must be excluded (question IDN7, PHI5 & PHI6)

Table 2 Validity Test Second run

No	IDN1	IDN2	IDN3	IDN4	IDN5	IDN6	IDN7	IDN8	IDN9	IDN10	IDN11	IDN12
rxy	0.38	0.31	0.38	0.23	0.21	0.49						
t count	5.02	4.02	5.08	2.86	2.67	6.88						
Notes	valid	valid	valid	valid	valid	valid	not valid	valid	valid	valid	valid	valid
Notes	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid	valid

Table 2 (95% 148)

1.9761

No	PHI1	PHI2	PHI3	PHI4	PHI5	PHI6	PHI7	PHI8	PHI9	PHI10	PHI11	PHI12	PHI13	PHI14	PHI15
rxy	0.36	0.39	0.34												
t count	4.71	5.13													
Notes	valid	valid	not valid	valid	not valid	valid	valid	valid	valid	valid	valid	valid	valid	not valid	valid
Notes	valid	valid	not valid	valid	not valid	valid	valid	valid	valid	valid	valid	valid	valid	not valid	valid

Table 2 (95% 148)

1.9761

Therefore there are 41 question valid can be used for the analysis because t-count > t-table.

For Reliability Test by using Microsoft excel, the Cornbach alpha coefficient is shown in table 3 below:

Table 3 Reliability Test

#of items	41
sum of the item variance	31.4820403
variance of total score	157.524319
cronbach alpha	0.82014851

According to Dahlan et al. (2014), the cornbach alpha scale is grouped into 5 criteria shown in Table 4

Cornbach Alpha	Internal Consistency
0.81 - 1.00	Very Reliable
0.61 - 0.80	Reliable
0.42 - 0.60	Reliable Enough
0.21 - 0.41	Not Reliable
0.00 - 0.20	Very Unreliable

Therefore because of the Cronbach Alpha of this questionnaire is 0.820149 refer to the table above this questionnaire or respond is Very Reliable.

After we have a result from validity and reliability test, we can continue to the next phase. We will using ADKAR framework to do an analysis in order to have a parameter of readiness.

Code	Description	1	2	3	4	5	Mean	Conclusion	Category
IDN1	1. Indonesia needs to accelerate the energy transition process because of its commitment to the Paris agreement	1	4	30	55	61	4.13	Agree	A
IDN2	2. Indonesia needs to accelerate the energy transition process because the future is there.	1	0	4	48	98	4.60	Strongly Agree	w
IDN3	3. Indonesia needs to accelerate the energy transition process because its fossil fuel resources will soon run out	2	5	29	42	73	4.19	Agree	e
IDN4	4. Indonesia must accelerate the energy transition process because it failed to improve the replacement ratio level of oil and gas	3	21	38	52	37	3.66	Agree	n
IDN5	12. As an archipelagic nation, indonesia should prioritize the development of Hydropower before any other renewable energy resources.	3	12	45	58	33	3.70	Agree	e
PER12	12. I care about energy transitions because it will affect the life of me and my grandchildren in the future.	1	0	7	44	99	4.59	Strongly Agree	s
							4.14		s

Awareness

Renewable energy provides reliable power supplies and fuel diversification, which enhance energy security and lower risk of fuel spills while reducing the need for imported fuels. Renewable energy also helps conserve the nation's natural resources. Renewable energy sources can be used to produce electricity with fewer environmental impacts. It is possible to make electricity from renewable energy sources without producing carbon dioxide (CO₂), the leading cause of global climate change. Based on questionnaire filled, the level of personnel awareness regarding energy transition is satisfactory. Almost respondent agreed that Indonesia need to accelerate the energy transition for several reason. Respondent believe that energy transition in Indonesia must be accelerated due to commitment to international community their vision about the future of energy is need of new sources because the fossil fuel will run out soon and utilization of renewables energy such as hydropower for the sake of future life of their future descendants and one of another factor is the failed of the nation to improve the level of replacement level of oil and gas.

Code	Description	1	2	3	4	5 Mean	Conclusion	Category
IDN5	5. Seeing the better condition of the level of air cleanliness during COVID-19 Pandemic, we must start thinking about leaving fossil energy.	4	13	35	53	46	3.82 Agree	D e s i r e
IDN6	6. After the COVID-19 pandemic, efforts are needed to accelerate the use of environmentally friendly new and renewables.	0	2	16	70	63	4.28 Strongly Agree	
IDN7	8. Regulations and the energy mix are in accordance with the conditions in Indonesia which still use fossil fuels as the main energy source.	2	5	31	78	35	3.92 Agree	
IDN8	9. I think that the energy transition is carried out according to the roadmap that has been determined while looking for new and renewable energy sources that are more environmentally friendly.	4	12	41	63	31	3.70 Agree	
PER1	1. I am ready for the Energy Transition Period?	0	3	21	64	63	4.24 Strongly Agree	
PER2	2. I am not worried about energy transitions	9	10	35	66	31	3.66 Agree	
PER3	3. I am not worried about losing my job because of an energy transition?	6	9	27	65	44	3.87 Agree	
PER13	13. I want to be involved in energy transition projects that are owned by the company	0	0	19	54	78	4.39 Strongly Agree	
PER14	14. I want to be involved in formulating a new strategy in facing the energy transition phase	1	1	25	58	66	4.24 Strongly Agree	
						4.01		

Desire

The energy transition means a fundamental transformation of our societies and affects everybody's day-to-day life. It is not only about climate change, greenhouse gas reduction and the use of new technologies. It represents an opportunity for structural change where citizens need to play a key role. The issue of citizen participation is central. How can the energy transition work for citizens? How can energy be accessible for all? How energy transition can attract upstream employee to be InTouch and participate in this movement. In this section, the overall score 4.01 show that the employee or respondent has a big desire to change. The Personnel are ready for energy transition period, they not worried with energy transition period and surprisingly upstream personnel not worried for losing their job because of energy transition. Respondent want to be involved in the energy transition projects that owned by the company. Respondent want to be involved in formulating new strategy in facing the energy transition phase. The air quality improvement in big cities during COVID-19 lockdown period has made everyone aware that maybe it's time to switch to better energy and

start thinking about leaving fossil energy. However, the respondent agreed that the energy transition is carried out according to the roadmap that has been determined while looking for new and renewable energy sources that are more environmentally friendly. The closest and easiest contribution for upstream sector personnel is providing supply of Natural gas as a bridging for the transition period according to National energy mix plan.

Code	Description	1	2	3	4	5 Mean	Conclusion	Category
IDN11	11. Indonesia will experience environmental and economic benefits of using renewable energy include: Generating energy that produces no greenhouse gas emissions from fossil fuels and reduces some types of air pollution.	0	2	14	61	74	4.37 Strongly Agree	K n o w l e d g e
PHI3	6. Companies should focus on discovering new reserves rather than thinking about the alignment of their vision and mission to the energy transition	19	48	48	24	12	2.75 Neutral	
PHI15	15. Electric cars is a threat to the upstream business?	21	45	46	27	12	2.76 Neutral	
PER4	4. It is important for upstream personnel to understand about energy transitions	0	1	3	45	102	4.64 Strongly Agree	
PER8	8. I am interested in participating in webinars on energy topics (Pertamina energy outlook, energy transition planning, de-carbonization, NRE development, etc.) but I did not get any information about the webinar. (Example: Webinar can be accessed https://ptm.id/PertaminaEnergyWebinar2020)	2	10	25	60	54	4.02 Agree	
PER9	9. I increase my knowledge of energy transitions by looking for myself	0	5	30	76	40	4.00 Agree	
PER10	10. Companies need to provide training on energy transitions for employees	0	1	15	63	72	4.36 Strongly Agree	
PER11	11. Companies need to provide a study scholarship on energy policies that will provide a deeper understanding of the energy transition.	1	3	16	61	70	4.30 Strongly Agree	
PER17	17. I have thought carefully about my future career, so that I don't get caught in an industry that is about to close!	2	19	56	46	28	3.52 Agree	
						3.86		

Knowledge

A new survey from McKinsey in October 2020, finds that responses to COVID-19 have speeded the adoption of digital technologies by several years—and that many of these changes could be here for the long haul. Refer to DNV study after COVID-19 outbreak there was a significant decrease on energy demand. Global energy demand will decrease around 8% due to reduction on economic activity and because of change in human habit such as less office activity also change in commuting habit. Movement begins to change the office mode to work from home mode, which will reduce the demand of office space in the future, directly impact on manufacturing sectors such as steel and iron industry.

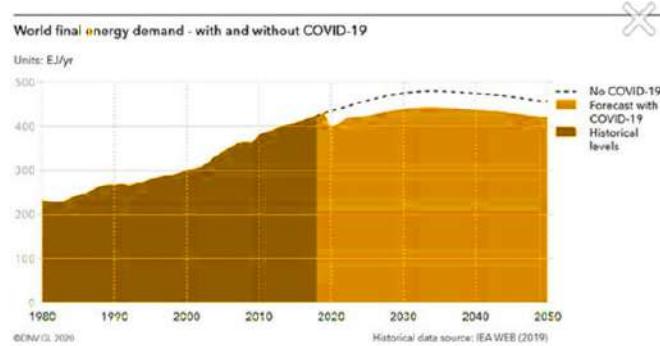


Figure 6 DNV Simulation on Future world energy demand

Digital disruption, decrease on global energy demand, Movement begin for cleaner energy, new technologies on DME, FAME and biofuels, Economic of scale in solar panel, abundant source of energy from geothermal and hydro power in Indonesia will be present as a challenger to fossil fuel as primary energy. To respond to these challenges, businesses must bridge the gap between the capabilities of current employees and the skills that will

be needed to drive future growth, and they must do this by upskilling the existing workforce. Upskilling is about more than just providing access to training. It's about identifying the knowledge, skills and experience that will be most valuable in the future for new and transformed roles, and the individuals who can excel in those roles. Developing an effective way to support and inspire people to take action today and continue to adapt in the future. This means understanding evolving skills gaps and mismatches, creating the right employee experience and buy-in to unleash energy for change, developing engaging skills-development programs, and driving return on investment with an appropriate learning organization and technology. From the ADKAR survey, respondent already have a well basic knowledge regarding energy transition. Everyone strongly agreed that Indonesia will experience environmental and economic benefits of using renewable energy include generating energy that produces no greenhouse gas emissions from fossil fuels and reduces some types of air pollution. Respondent are excited to attend webinar and training. Respondent strongly agreed that the company can provide training and also scholarship that will provide deeper understanding on the energy transition issues. However, respondents seem doubtful about a career in this oil and gas industries. It shown in their answers to the questions about the purpose of the company to find new reserves and the threat of electric cars that will become opponents that must be taken into account in the future as competitors for internal combustion engine vehicles which are one of the largest consumers for oil and gas industries nowadays. Their respond neutral to this question.

Code	Description	1	2	3	4	5	Mean	Conclusion	Category
IDN10	10. Some challenges such as policy uncertainty, market barriers, financing barriers, and low renewables manufacturing capacity have been contributing to the sluggish development of renewables in Indonesia.	1	2	23	48	77	4.31	Strongly Agree	Ability
PHI2	2. Companies need to start thinking about a new inline vision and mission with energy transition mapping	0	2	12	71	66	4.33	Strongly Agree	
PHI5	7. Indonesia is still deficit in oil and gas production, so I am still optimistic that the upstream business has a good going concern.	4	15	45	65	22	3.57	Agree	
PHI7	8. The company will still last longer than the period of time that the oil and gas reserves will run out	10	25	51	48	17	3.25	Neutral	
PHI9	9. The company will discover new oil and gas reserves	2	2	46	67	34	3.85	Agree	
PHI10	10. The company will continue to carry out upstream activities taking into account the reduction of carbon emissions	1	2	34	75	39	3.99	Agree	
PHI11	11. The company is already thinking about carbon emission reduction	2	16	44	60	29	3.65	Agree	
PHI13	14. The company must start thinking about a plan if fossil fuel is not the main choice in the community	2	3	19	64	63	4.21	Strongly Agree	
PHI14							3.89		

Ability

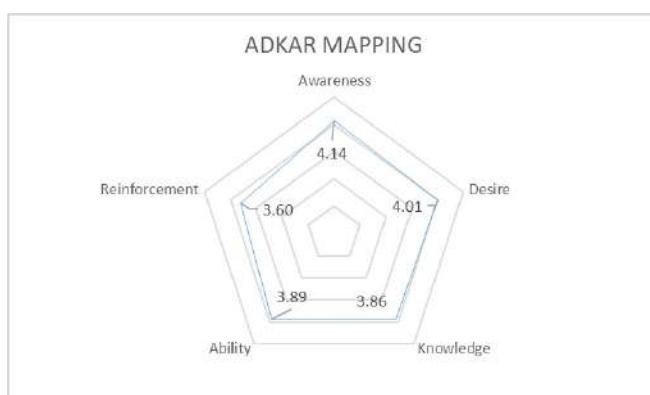
Currently all the focus and attention from the government are centralize on COVID-19 handling. Oil and gas company should put more attention on the pace of energy transition and the resulting impact on demand. Oil and gas companies should also carefully consider the potential for accelerating energy transitions, especially in Asia. This may have significant implications for some companies, impacting strategies, portfolios, and investment decisions. They should also revisit capital allocation processes in new demand scenarios. Oil and gas company should have an flexible and agile approach in adapting and investing in new low carbon technology. Based on the questionnaire

analysis respondent strongly agree that Some challenges such as policy uncertainty, market barriers, financing barriers, and low renewables manufacturing capacity have been contributing to the sluggish development of renewables in Indonesia. Companies need to start thinking about a new inline vision and mission with energy transition mapping and also believe that the company must start thinking about a plan if fossil fuel is not the main choice in the community anymore are strongly agreed by the respondent. However respondent still optimistic on the company going concern because of the respondent believe The company is already thinking about carbon emission reduction and believe on the ability of the company to discover new oil and gas reserves and will continue to carry out upstream activities taking into account the reduction of carbon emissions.

Reinforcement

The current energy supply system, based largely on fossil fuels, must instead be based on renewable energy. Many countries have recognised the urgency of action and have committed to a carbon-neutral future. In this challenging scenario, it becomes of vital importance for both international and national oil companies to assess the future of the energy system, trying to position themselves and find solutions that would keep them in the market and maximise value creation while contributing to global climate change mitigation. On the last part, we can see that the respondent put some doubt about company position in the energy transition period. Refer to the respondent response which mostly replying neutral statement, the company did not seem ready to face the energy transition period and it is not reflected in the vision and mission and the company. Not yet carried out a vision and mission in accordance with the energy transition for example there were no readiness for to make carbon tax payments. The response for the company provides system for employees to accelerate their understanding of energy transitions also neutral, indicates that employee did not seem company provide system that can help employee to learn and increase their knowledge in energy transition. One of the most fundamental aspects that good leadership drives in people is their willingness to contribute. This means phenomenal work comes when people have the passion and the desire to take initiative. Logically, the cure to powerlessness is empowerment. The company must reinforce their employee by providing system for employees to accelerate their understanding of energy transitions. The company can provide information about the activities the company is doing in the energy transition from internal media, internal broadcasts, and internal webinars. In this part, respondent agreed that Employee must be equipped with the latest knowledge and information about energy transition. Upskilling and reskilling should work hand in hand for your organization

to achieve more internal mobility, enabling your talent pool to develop further personnel mobility to the new and renewable affiliates will provide great experience to prepare the upstream employee to be ready for the Energy Transition Period. The truth of the matter is that the talent market and the work landscape are continuously changing. Having a skilled workforce within your company can help you immediately promote and reassign your employees whenever the need arises. According to Deloitte, internal talent mobility can also boost employee engagement by as much as 30%. Since reskilling is a central element to achieving internal mobility, employees who are developing and are given the opportunity to learn other things outside of their own fields become more engaged not only in the reskilling programs but also in the company. Engaged employees equate to better productivity for the company. One of the greatest benefits of having internal career mobility is that you allow your employees to further nurture their knowledge and skills, increasing their professional competencies that match the demands of the ever-changing workplace. Employee mobility can support long-term employability of your workforce by encouraging them to shift roles, projects, and work assignments. It creates room for lateral growth by giving chance to have new capabilities through series of upskilling program. Having a strong skill set gives anyone the freedom to expand their skills set, pivot to another career path, and grow more within our organization. Upstream employee ready to move to Sub Holding new & renewable for example to geothermal with respondent score 4.17. With a score of 4.31 Upstream employee strongly believes that movements to the new & renewable Sub Holding will provide new exposure to the energy transition. Based on respondent response, respondent strongly agree that companies must equip workers with new knowledge so that workers are ready at any time to be assigned to other energy companies within the scope of the holding with score 4.44.



Referring to Angtyan (www.irmbrjournal.com, 2019) The ADKAR model is a valuable framework for organizational leaders, change managers and project managers to effectively lead a wide variety of changes. To capture the

changes needs in adapting to energy transition period therefore the authors use ADKAR as the main tools. The major findings of dominant factors based on the ADKAR Analysis mapping from the response gathered, result from the examination for the primary data result, and combined with secondary data and observations from the researcher, herewith are the points to answer the research questions as described in the business issue exploration:

1. Based on change management model, how do upstream personnel understand regarding the acceleration of energy transition currently?

Refer to the ADKAR model with mean 4.14 in awareness, the level of upstream personnel awareness regarding energy transition is satisfactory. Almost respondent agreed that Indonesia need to accelerate the energy transition for several reason. Respondent believe that energy transition in Indonesia must be accelerated due to commitment to international community their vision about the future of energy is need of new sources because the fossil fuel will run out soon and utilization of renewables energy such as hydropower for the sake of future life of their future descendants and one of another factor is the failed of the nation to improve the level of replacement level of oil and gas.

2. To what extent is the Company ready to enter the energy transition period? What strategic actions have been taken so far?

Based on Internal and external analysis, Energy transition in PT PHI has been carried out with some strategies, namely :

- o reducing greenhouse gas emission
- o utilization of renewable energy sources such as photovoltaic in operational
- o stepping out for gas field exploration
- o utilization of gas as vessel fuel.

It is proven that Pertamina Hulu Indonesia ready to face the energy transition period through some effort has been successfully completed. Refer to ADKAR scoring, ability has a mean 3.89 Based on the questionnaire analysis respondent strongly agree that Some challenges such as policy uncertainty, market barriers, financing barriers, and low renewables manufacturing capacity have been contributing to the sluggish development of renewables in Indonesia. Companies need to start thinking about a new inline vision and mission with energy transition mapping and also believe that the company must start thinking about a plan if fossil fuel is not the main choice in the community anymore are strongly agreed by the respondent. However respondent still optimistic on the company going concern because of the respondent believe The company is already

thinking about carbon emission reduction and believe on the ability of the company to discover new oil and gas reserves and will continue to carry out upstream activities taking into account the reduction of carbon emissions

- What are the main findings on the change management model regarding the readiness of upstream personnel to face the energy transition?

Based on the research from IRENA skills on demand for energy transition dominated by engineering background. Therefore there are a requirement of engineering background in skillset required for Energy transition. On Annual report PHI 2019, the employee were dominated by engineering educational background by 79%, therefore PT PHI ready to face the energy transition, however to fulfill the gap between current skills and future skills there are requirement to do upskilling and mentoring in the future. Based on ADKAR analysis Desire has a mean score 4.01, the score show that the employee or respondent has a big desire to change. The Personnel are ready for energy transition period, they not worried with energy transition period and they not worried for losing their job because of energy transition. Respondent want to be involved in the energy transition projects that owned by the company. Respondent want to be involved in formulating new strategy in facing the energy transition phase. However, with Knowledge part has a mean score 3.86 and reinforcement has a mean score 3.60 indicated that company can improve this score by : the company can provide training and also scholarship that will provide deeper understanding on the energy transition issues and just because respondent are excited to attend webinar and training. Employee must be equipped with the latest knowledge and information about energy transition, personnel mobility to the new and renewable affiliates will provide great experience to prepare the upstream employee to be ready for the Energy Transition Period.

Based on the conclusion above, the author would recommend some action to be done by the company in order to achieve personnel readiness in energy transition.

- Companies need to start thinking about a new inline vision and mission with energy transition.
- During the energy transition period company will continue to do an exploration and exploitation which put safety as top priority and continue to operate carbon emission reduction program in every E&P activites.
- The company can provide training and also scholarship that will provide deeper understanding on the energy transition issues and just because respondent are excited to attend webinar and training. Employee must be equipped with the latest

knowledge and information about energy transition.

- Personnel mobility to the new and renewable affiliates will provide great experience to prepare the upstream employee to be ready for the Energy Transition Period.

The change management process can be done by formulating the strategic plan using Kotter Framework as shown in below table.

No	Step Title	Kotter Theory	Recommendation in PHI
1	Create Urgency	75% Company's management to support change	Conduct FGD in PT PHI to gather management current knowledge and to increase the awareness of energy transition
2	Create Guiding Coalition	Build the guiding team	Issue Task Force Memo based on FGD result consist of employee from multi division and multi background of education
3	Create a Vision	Guiding Team to create a clear vision and strategies for employee to understand the main goal of the change	The Task Force will formulate project goals and objectives and preparing business process flow and the timeline to make sure the project plan are well elaborate and decide the focus of the project
4	Communicate to buy-in	Employee to belief that useful change is mandatory and sacrifices is required	Create a campaign and socialization regarding the project through internal communication channel such as, email blast, internal web, internal social media, poster, banner, etc. ad create an involvement program to involve all employee can contribute to this project.
5	Remove Obstacle	Removal of obstacle. E.g. formal structure that make it difficult to act, lack of required skills that undermine action, system that make it difficult to response, and discourage action from leaders at implementing change	Preparing a mentoring or coaching for management level in order to create same perception regarding this energy transition project. Manager above will lead the team to identify obstacle and propose a solution to the task force. Approved solution should formulate into procedure, which can break the barrier.
6	Create short term wins	Need to prepare a process of producing short term or quick wins for the changes	Create KPI or select a champion program which reasonable and could fulfil by the team or by the company in short term. For example formulate new vision and mission which align to the position of the company in energy transition period

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Paper 77

Detecting Insider Attack from Behavioral and Organizational Approach

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Abstract - With alteration in many activities to digital procedures comes vulnerability. Cyber-attack risk keeps increasing for individuals and businesses. One of the attacks that could occur inside companies or organizations is an "Insider Attack". Due to the complexity of human factors, this issue is mainly dealt with and discussed in previous studies through a technical approach. This research aims to find the correlation between the possibility of insider attacks with behavioural and organizational factors. To evaluate the difference in practice between different business sectors in Indonesia. The data were collected through semi-structured interviews with people from diverse work backgrounds conducted online. The interview was recorded and transcribed manually. The data analysis was done using tables to help the coding and correlating variable process. This research is supposed to determine the most impactful factor based on people's views. Possible gaps were found between theories and what happened in the practice of the company or organization. This research outcome intends to give information to future research and serve as a reference to businesses and organizations about current development and gaps in a business environment.

Keywords - Digitalization Risk, Cyber Security, Cyber attack, Insider Attack, Behavioural and Organizational Factors, Gaps, Prediction, Prevention.

I. INTRODUCTION

This research was done to address and answer four questions related to cyber-security. First, the focus will be discussing the interaction between organizations or businesses towards cyber-attack, specifically the "Insider attack". Second, the exchange will consist of prevention and action were taken in facing cyber issues through a socio-technical perspective; as mentioned in a few past research [6, 13-14], the balance between technical and non-technical approaches is needed to achieve the desired result in facing this issue. Third, the approach will focus on the organizational and behavioural aspects as suggested by past research by Geitzer in 2018, where future research in this aspect, especially the relationship between factors, needs to be addressed [14]. Fourth, the improvement of technology is impacting many sectors, especially businesses. It is common for companies to strive for opportunities without proper precautions and adequate security measures [34].

This research aims to put past research theories into Indonesia's work environments. Data safety is crucial in the banking and communication sector [36]. This research will focus on "Insider Attack" prevention and control through a non-technical approach. Several efforts have addressed cybercrime problems across government, industry, and academia [25, 38]. As a result, companies specializing in cyber security are emerging with increasing demand. To know how the organization or company approaches the problem, the interview will discuss the employee or staff's experience with the past issue and the impact the work environment has gone through. With the semi-structural discussion, this research aims to understand the responses and reactions that the interviewees delivered [9]. The semi-structured interview has the advantage of being reasonably objective while still allowing a more detailed knowledge of the respondent's thoughts and reasons than a mailed questionnaire would allow. In-depth opinions are best obtained through a one-on-one interview [7].

Insider threat utilizes privileged access to compromise the confidentiality, integrity, or availability of the organization's information, systems, or infrastructure categorized as malicious insiders [17, 37-38]. The second threat is an unintentional, or non-malicious, insider, who is thought to be the most prevalent [6, 10]. Phishing is a cyber-attack where the suspect uses impersonation methods to gain information or data from the victims. Phishing attacks a company's vulnerabilities in their network, including their employee. Phishing can be caused by an insider attack, whether malicious or non-malicious [17]. Human error is inevitable, and it would take a while to detect an attack, but that does not mean the risk could not be reduced ([17, 25-26, 31].

The technical approach is more commonly used to tackle the cyber issue [2, 4-5]. A socio-technical approach is needed to balance the solution despite solving some parts of the issue. Since 1980 suggested, a socio-technical method based on multi-perspective concepts to aid in evaluating new and existing technologies in the 1980s. Research discussing the socio-technical or behaviour-related approach [3, 13-14, 25] is emerging, and some have come up with frameworks or ontology to set boundaries in their research.

Vulnerability can be caused by the company or organization's negligence; the more data and security breaches occur, the more resources organizations

spend to prevent them. A digital economy is described as economic activities that are based on, rely on, and develop from the use of technology. This caused changes in how businesses operate, for example, transaction process, consumer engagement, and communication with stakeholders. The increase in cyber threats that occurred in 2020-2021 experienced an increase of 6.15% [29]. Despite the increasing number of insider attacks and cyber-attack in Indonesia, there is still limited research that addresses the issue specifically in this country and sectors [18-19].

Because of the risk of invading employee privacy, leaking crucial organizational information, or sacrificing a competitive advantage unintentionally, organizations and teams are hesitant to release this information, making it challenging to gain information regarding actual practice [10]. Nevertheless, the awareness of the importance of this topic seems to have not spread evenly due to different knowledge limits in each country and how policy or law works in that country [29]. Some organizations have reported similar cases, but some might be reluctant to do so since this issue could affect the company's reputation and credibility and shows vulnerability inside the company [10, 16]. Furthermore, most businesses were bureaucratic, with positions defined and organized hierarchically [3]. Therefore, there are gaps in opinion between generations and different Hierarchies inside the organization [13, 15, 25].

As the main country subject in this research, Indonesia shows those gaps. According to CNBC Indonesia, Cyber Attacks caused Indonesian Banks to lose around IDR 246 billion in 2021 ([36]). Insider threats accounted for 58% of reported security incidents [17, 20]. Based on CNN Indonesia, in 2020, Indonesia experienced Phishing attacks on as much as 7.6 % of the population, categorized as moderate [18]. News and articles about cyber-attack in Indonesia keep increasing, yet the knowledge development on this matter did not grow as fast as the issue. Research that explicitly discusses this country is limited, and rather than giving a solution, most of it only aims to review the case [1, 4, 29, 30, 36]. In business matters, employees experience the issue and the effect they need to adapt to while working rather than have a common understanding from the beginning of the work mentioned by [3] relating to training implementation inside an organization.

Researchers are overwhelmed by various possibilities in assessing human behaviour, which is why theoretical frameworks are made to set guidelines and boundaries in analyzing [2, 10, 12, 13, 15, 31]. This research adapts some of the frameworks, some are simplified due to time constraints, and the framework is re-assessed from the interview [9]. Assessing employee behaviour did not fall too far from discussing employee performance [3]. The

surest way to determine employee behaviour is through their performance indicator [10]. However, the research that correlates performance appraisal and cyber-attack is limited; most studies discuss this topic separately. While the performance appraisal research focuses on improving employee performance and assessing employee wellbeing [20, 35]. In this research, both topics are related to the issue, that is, insider attacks, which include cyber security and employee behaviour and performance [17, 19, 12].

The framework was constructed for advanced and detailed research that would be too complicated to elaborate on each factor in a limited time. Therefore, only a few factors are going to be discussed. The SOFIT framework is used as a foundation while the factor is adapted to the sample target. In individual factors, motivation, competence, ability, acceptance of roles, resources, and work environment are the factors that will be discussed, while organizational; security practices, communications, management systems, and work planning aspects will be addressed [23]. As a result, researchers and companies will be able to index incidents and better understand prevalent attack vectors based on human behaviour ([31]) [35].

Security awareness for employees can reduce cyber risks by up to 70%. Performance appraisals positively affect employee performance [3, 10]. Integrity affects employee loyalty. Many organizational and behavioural approaches are made [20, 24]. Due to an overemphasis on more immediate reasons, which tend to focus on investigating accidents, mishaps, and other failures, potential organizational contributing elements may go unnoticed. For example, falling for a phishing email could be dismissed as a "human error" and attributed entirely to the user [5, 24, 32, 33]. However, other more systemic concerns, such as insufficient or poor training, overwork, poor team management, corporate regulations, company enforcement of policies, and management systems and practices, could all be at play [23]. In practice, even the most prepared policies and standard operating procedures have human error as their weakness.

II. METHODOLOGY

Introduction

The study for this paper will be focused on previous frameworks and conclusions. As a result, this research will be based on secondary and primary data. The use of secondary data is because of the relative speed and low cost. The use of preliminary data will be used in this study as well. It is, however, employed as an addendum or supplementary material for the research to support the leading theory from the material gained from past research. This research data will focus on qualitative methods.

The case study will be used to build the conceptual and theoretical frameworks. Through in-depth interviewing, sympathetic understanding, and suspending or bracketing preconceptions about the topics under discussion, the researcher strives to acquire data on the perceptions of local participants from the inside [21, 27].

One of the essential characteristics of well-gathered qualitative data is that it focuses on naturally occurring, ordinary events in natural contexts, giving us a good sense of what "real life" is like [28]. The goal of the interview is to support available theories and to gain perspective from the direct discussion. Data will be gathered through in-depth interviews. The qualitative technique differs from the quantitative method in that hypotheses are formed through questions and narrative descriptions rather than hypothesis testing in qualitative research [22].

The tools used in the data analysis will be Data Matrix / Conceptually clustered matrix and other programs like Microsoft Word and Excel to organize the textual data gained from the interview. The method used to analyze is the combination between content and narrative analysis. The codes are determined manually according to the research questions and objectives. Identifying similar expressions, correlations between variables, patterns, themes, categories, distinct differences between subgroups, and common sequences by sorting and filtering these coded data [28]. The pattern in a narrative method shown in the result will be used to analyze the gaps and interconnectedness between participants in answering each question. The matrix in the form of a table will help to gain a better overview of the interview and compare responses; this will help monitor any anomaly and consistency inside the response. Conceptually clustered matrices are extremely useful when certain prominent concepts or themes emerge from the initial investigation [27].

Research Settings and Participant

In this research, the participants will be taken according to their expertise and divided into four categories. Participants come from an educational background or working/were working in that field. The interview is semi-structural; therefore, the interviewees can adapt the question. The questions are formed according to the research objectives. The participant's name will be anonymous to respect the participant's consent. For this research, the participants' names will be coded based on their working field and numbered as in (participant 1, participant 2).

PP	= People Performance
OHR	= Organizational and Human Resource
CS	= Cyber Security
BT	= Banking and Telecommunication

Background Category	Objective	Number of Participant
People and Performance	aims to understand the ways to approach employees and to support the goal of this research which is to give suggestions for a performance appraisal system	2
Organizational and Human Resource	The goal is to gain insight for the strategy from organization environment. This research is not only aiming for technical solution but also to build a strategy in behavioural approach.	2
Cyber Security	The focus of this research is to analyse a cyber security related issue. Therefore, to identify the risk and issue possibilities that might occur for the business and to understand the theoretical and practical experience in the field	2
Banking and Telecommunication	to interview employee and ex-employee from this field to see whether there are gaps between periods. Hierarchy inside the company also will be used as analysis thus the participant position varies. Interviewing this field also aims to analyse the policy or procedure improvement and awareness inside the field from employee perspective.	3

Fig. 1. Interview participant classification

Theoretical Framework

Employee motivations for conducting a harmful attack are diverse and complex, making them difficult to assess. We used work-related stress levels to measure motives in our framework. For example, we looked at authorized users' attitudes toward the workplace, employee support from their line manager or coworkers, coworker relationships, and employee understanding of the organization's security policy [11]. Employee age and gender also have an impact on motivation levels. Because individuals are anticipated to realize their intents should an opportunity exist, opportunities determine the possibility of authorized users executing a malicious insider threat [13].

The expertise and ability of an employee to carry out/enable various types of security breaches are referred to as capability ([14]). Insiders have privileged access to the organization's data assets (perhaps for extended periods) which might provide these authorized users with the capacity to learn about and understand the security mechanisms in place. For example, employee access rights to intellectual property and job knowledge were used to assess capability levels (Elmrabit et al., 2019; Walker et al., 2018).

Another factor discussed was Hierarchy, which in this research will be used to find gaps in the response between the participants. People who live in groups

and organizations, like most of us, and social scientists who study groups and organizations know that your role influences your perspective on life. A role is a complicated mix of expectations and behaviours that define what you should do as a specific type of actor in a given situation. A role-ordered matrix group summarises and contrasts different people's role perceptions on certain themes or concerns, allowing the researcher to compare and contrast them. For example, bosses are generally blind to their employees' frustrations, partly because they are removed from them and because subordinates frequently suppress unpleasant news when reporting upward [27].

Conceptual Framework

Additional constructs can be added to the currently available ontology, which has caught important constructs from the literature. In this research, more studies on organizational variables that expose a company to heightened insider threat risk would help to specify further the lower-level leaf nodes and instances [19]. When informed by ontology relationships, models that use estimates of threat values for individual indicators can be used to anticipate threats in scenarios involving collections of indicators [10, 13-14, 25, 32].

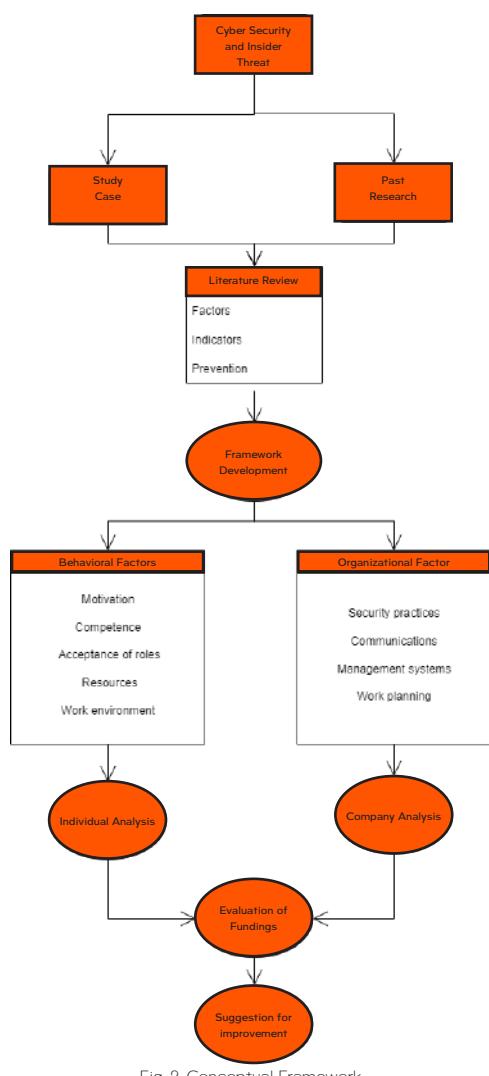


Fig. 2. Conceptual Framework

Validity and Reliability

The phenomenon can be studied in its natural setting and meaningful, relevant theory generated from the understanding gained through observing actual practice. Although some researcher argues that validity and reliability are needed in qualitative research, in this research, this section will help explain the attempt by the researcher to avoid biases and miss interpretation of the data collected. The reliability can be seen from the consistency in the answer, which will be presented in a graph projected from the researcher's administered questionnaire based on the participant's responses. Furthermore, the question can measure the generability of this research addressed to the interviewer. In the semi-structured interview, the main question asked is the same for all the participants despite the difference in their field of work background. The participant gave an opinion based on their experiences, showing that findings can be applied to another context, setting or group.

III. RESULTS

Overview of Finding

Below are the findings of this research which will be elaborated on.

1. There is a correlation between employee well-being and the working environment
2. It is possible to predict possible attacks from the employee performance
3. Employees are aware of possible attack
4. Only half of the participants have experienced cyber security education provided by their workplace
5. The gap of knowledge in cyber security is more prominent when comparing between working fields rather than comparing from working period inside the same industry
6. Country's policy and the firm have an essential role in giving guidance related to working place practice that correlated to the awareness of security
7. Most of the participants experienced or witnessed a cyber attack
8. Some of the cyber attacks the participants experienced or witnessed took place in their workplace
9. Most of the participant agrees that a performance appraisal system help improve employee spirit and well-being whilst monitoring the possible attack

10. Hierarchy affected how the employee express their concern and discomfort [16]

Sometimes experiences were not obtained due to rejection of learning; one of them can be described as a silo mentality where there is reluctance in sharing and gaining information within a company [8]. Every participant is familiar with the term "Cyber-attack". They gained knowledge regarding cyber security from outside and inside their workplace but mainly express learning this topic outside of the work environment.

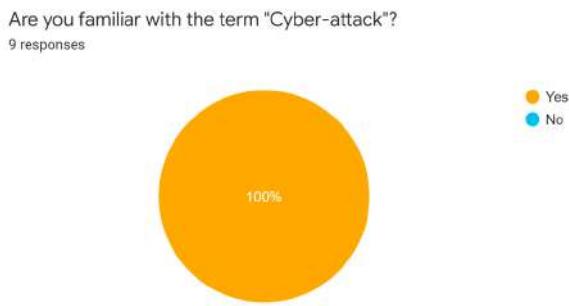


Fig. 3. Cyber security awareness pie chart result

Despite the awareness the length of knowledge and familiarity for cyber security context seems to vary. The awareness is affected by the working field and the company main operation [32].

Code: Cyber Security Awareness

Participant: OHR 1

Yes, I am aware that the company is at risk of cyberattack, especially since the company also revolve around technologies and software. The company itself haven't really executed any training and given the employee much knowledge about it.

Participant: PP 1

Yes, the risk is high especially with digitalization keeps developing at such a fast tempo and the company are also operates with digital software.

According to samples in this research, we can conclude that the issue is not the lack of awareness in the country [29] but the extent of people's knowledge about cyber security, mainly affected by their field of work. For example, participants that work in the banking and cyber security field have more experience and knowledge regarding the systems implemented for the company to ensure cyber security. This is shown by the amount of system implementation in the company.

Code: Cyber Security Experience and Knowledge

Participant: BT 2

Important document like collateral document are protected by separate department called the custody department. There is a vault to store the documents. When a department or an employee need to use or borrow some documents there are some safety measure that needed to be oblige to, for example it is mandatory to have a permission letter and to register. Which even with that much rules there are still some cases where the documents is lost. Sometimes it was caused by "unmatched" document registration. Human error in operational risk will always present.

The participant from the banking sector can give a detailed description of the rules implemented and provide examples of possible issues and cases. While the participant in the other field showed knowledge that was informed formally by the company only, not all aspects related to their work.

Participant: OHR 2

Yes, during our internship, we were given a link tree, which contained a booklet that contained information about the company, facilities, do's and don'ts for interns, floor plans, and company rules. There is also a COVID 19 SOP Employees are encouraged to study and know the structure and rules of the company. Yes there are restrictions for the use of zoom, whatsapp. Right now I haven't taken care of the external part so I only know about the internal system.

This is not to compare which field of work is better, rather this comparison can show the priority of companies. This can also visualised where the cyber security topic stay in the company priorities.

Have you experienced a "Cyber-attack"? (inside a company / organization)
9 responses

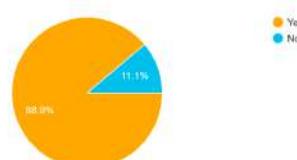


Fig. 4. Cyber security experience pie chart result

Have you witnessed a "Cyber-attack"? (inside a company / organization)
9 responses

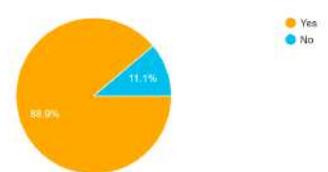


Fig. 5. Cyber security experience pie chart result 2

Only the minority of the participant that have not experienced a cyber-attack. And one of that participant responds with the possibility of the issue might have happened but the participant have not heard about it.

Code: Cyber Security Experience and Knowledge

Participant: OHR 2

I haven't heard any case related to this but maybe it happened before. If it's a case that not related to cyber, I have heard a few cases. It does harm the company but rather than directly about the cyber attack it's more to a case that could have been detected if the cyber system in the company is already implemented correctly. For example procurement of goods manipulation, if only our cyber system was used accordingly this case should have been detected sooner.

With this we can conclude that majority of participant as an individual or an employee have experienced a cyber attack [3, 13, 18]. From past research it is shown that majority of people have experienced or witnessed cyber attack but people are still unfamiliar with the term or have limited knowledge about the issue.

Are you familiar with the term "Insider attack"?

9 responses

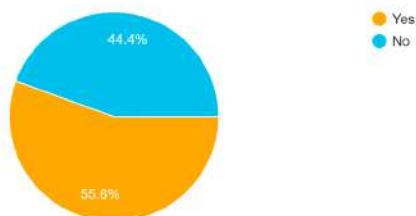


Fig. 6. Cyber security familiarity pie chart result

While for the term "Insider Attack". Participant shown more unfamiliarity with the term. After a brief explaining some participant turns out to be familiar with the topic but not with the term [14]. This will be evident in the graph below where most of participant have experienced the attack and all of the participant have witnessed the attack inside their company.

Have you experienced a "Insider attack"? (inside a company / organization)

9 responses

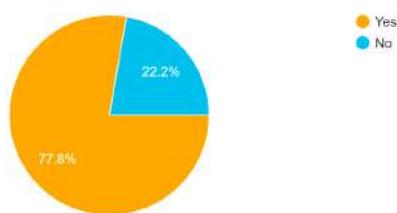


Fig. 7. Insider attack experience pie chart result

Have you witnessed a "Insider attack"? (inside a company / organization)

9 responses

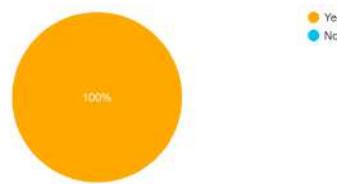


Fig. 8. Insider attack experience pie chart result 2

All participant have experienced insider attack. Despite the experienced some also convey their lack of knowledge about the topics. Some participant convey their concern regarding the lack of thoughts their company put in the matter [35].

Code: Cyber Security Risk Awareness

Participant: OHR 2

Yes, the risk is high especially with digitalization keeps developing at such a fast tempo and the company are also operates with digital software. Unfortunately, the company I'm working at still haven't put a lot of thought into the issue. The company's focus just has not yet reached that to that point but slowly the company seems to try to dig more into this topic.

Some participant elaborate their experience during the attack and how was the issue impacting the working environment.

Participant: CS 1

Obviously accidental ones do happen. And I and I when I worked for a holiday park, I worked with a lady who accidentally sent. The medical record, medical, financial and personal details of nine employees to a customer. There was a lot that was going on, like salary information, bank account details, any issues they'd had with in met with their medical history. And she just left. It's really hard position for them because that's a major GDPR violation. And it was a total accident.

In this case the participant witnessed a non-malicious attack. We can see that the impact is significant for the company and the woman in the story despite the issue occur unintentionally.

Do your organization / company implemented policies related to cyber security?

9 responses

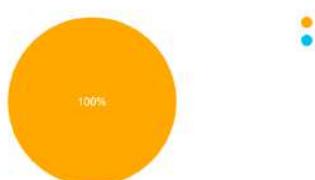


Fig. 9. Cyber security in organization pie chart result

All the participant respond is positive, the company they are working and worked for implemented policies and procedures related to the cyber security [18, 35]. Whether it is for prevention or countermeasures when the issue takes place. The rules vary on the field of work [34]. The more important data security the more detailed and rigid the policies are [36]. For example, one of the participant from the banking field convey the reason they resigned was because of the overwhelming amount of rules that implemented in the company. But they show their understanding and supported the policies.

But the official policies and rules inside banking industry are already detailed and rigid, which actually became one of the reasons people might be quitting. That includes me, i understand the importance and realy appreciate it but for me personally after working in this sector for quite sometimes it was tiring and mentally weighing.

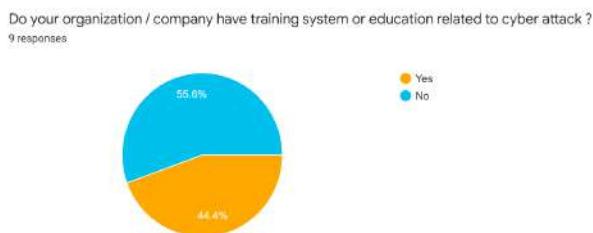


Fig. 10. Cyber security in organization pie chart result 2

Most participant have no experience training relating to cyber security in their working place. Some participant said that the company is using 3rd party like hiring people outside of the company to deal with the issue.

Participant: CS 2

Yes, and don't do training, but just hire a professional (example: build a firewall)

Some participant said that training is not their company's main concern. Thus, the company just implement policies and rules. Training might take time and cost some mony whis is why some company opine that training is not part of their priority but some company put training as one of their future planning [14, 20, 35]

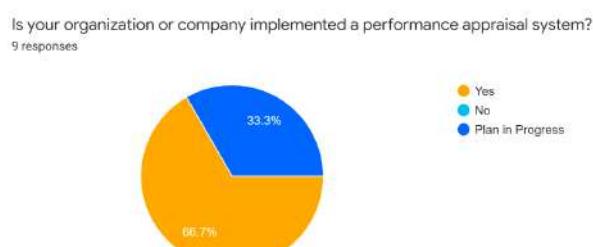


Fig. 11. Performance appraisal in organization pie chart result

Some participant workplaces implemented a performance appraisal system, which according to the participant

the system affects the working performance inside the company [3, 10]. The main feature was mentioned by several participants in the KPI and the report delivered to the employee. The KPI is believed to be an essential tool for an objective indicator of employee performance. The KPI help the company monitor the operation targets. The report, which is usually delivered in a descriptive manner accompanied by average scoring, allows the employee to understand their strengths and weaknesses, which can be a significant introspection for the future. Participant conveys feelings of appreciation for the report, which increases motivation.

Participant: PP 1

Yes, there are some performance appraisal strategies in preparation. With this new system, hopefully, the contribution of each employee can be appreciated. The physical, spirit, and thoughts of each employee should be appreciated. With this, we also hope that we can monitor what is it that the employees are lacking and provide support for that. Employees that didn't perform well hopefully can be seen and be given a warning in the future.

Although some participant convey that the company they have been working in did not implemented a performance appraisal system. Is not that the company do not have the system, it just the system is still on planning process and have not yet been implemented. The main caused to this issue is the company current focus to the project which caused a delay in developing the system and the company workload. Some participant convey their concern for this delay.

Code: Behavioural Factors

Participant: BT 3

The first motivation, competence, work environment is very influential on motivation, ability, acceptance of roles, resources. If motivation is needed to work, competence must be possessed, when accepted in a company it means that we are considered to have the competence to work there. The work environment must be fun or comfortable to support work performance. Ability can be honed during work.

Participant: PP 2

Competence is needed to do a task, without competence the result of the job might be not accordingly and not reach the satisfaction standart. The environment is important, the

environment can improve motivation. If the environment is supportive, not giving too much pressure i think the motivation for the members to work well might be improve. Resource is important but without motivation resource might be useless. Role accepting is the least because i think that a person can have multiple skill that can help them adapt in many roles.

Motivation and work environment have been the most discussed factors. The participant convey the importance of motivation accompanied by competence as individual factors to the performance. Competence is important to maintain the motivation, it is needed for the employee to be able to do their work to enjoy their work [3]. Without competence the employee could experience pressure and lacking in their performance. The environment is also related to the motivation, participants opine that with supportive work environment the motivation will increase and the performance will also increased [14, 16-17].

Code: Organizational Factors

Participant: BT 3

Good work planning and in accordance with the vision and mission of the people in the company (not just according to the leader) is very important. A management system is needed to set goals and to provide a foundation for the system. The way to support all of that is through communication, because that's why there is PR in a company. Not only by PR communications within the company must be carried out by each other to distribute information. The first security practice, employees must have knowledge of their own company to be able to work properly and according to the rules.

Participant: PP 2

Security practice, management system, work planning, communication. Communication is not the main issue in my case since everyone have their own job and platform, each of us doesn't really relate to each other task which means that communication was not that necessary for the working process. Security practice, it is the most importan because i think we do need the knowledge and awareness for the whole member because with that lacking it will caused vulnerability.

The response for the organizational factors varies but participant shows agreement in the importance of all factor especially in work planning [2]. BT 1 is still working

in this field currently and holding a higher up position. They shown a higher satisfaction towards the system. Whilst talking about the issue they convey the concern as minimum as possible. BT 2 was working in the same field and similar hierarchy but since this respondent is not bound to their work anymore they manage to convey more about the concern and the issue inside the company. The satisfaction in the working and the system is also lower.

Code: Current System Satisfaction

Participant: CS 2

So far, I feel that the regulations are in accordance with what is needed. Regulations already maintain systems and operations within the bank. In my opinion, regulations that regulate internal banks or external banks have facilitated the needs of banks. The existing rules already provide sufficient protection.

Participant: OHR 1

I think it would be nice to have a PA system. Maybe with this, every employee could prove their effort and the judgement will be accordingly rather than judgement and rewards based on "closeness" or how people present themselves to the higher-ups. With PA I think we could minimize the risk of freeloaders. With PA each individual will also have their own KPI so we can monitor each employees' workload.

IV. DISCUSSION

Research questions answered

This research consists of 4 Research Question which developed to be the objective foundation of this research.

1. How can organizations detect cyber insider attacks?
2. How can cyber-attacks be prevented, what action can be taken by the organization?
3. What challenges do organizations face in detecting and preventing cyber-attacks?
4. What recommendations could be made to assist organizations regarding cyber-attacks going forward?

This section will use the findings from the analysis to answer the research questions. The answers to the first and second research questions will be related to one another. From the analysis and findings of this research, detection can be done by monitoring employee behaviour and performance in the company. The team leader or

teammates can watch each other through the project process. The interview participant opines that it is good to have peer evaluation at the end of each project. Other than appreciating the finished work, the member lacking in their target or performance can be evaluated and recommended for future projects. With the evaluation, the company will be more aware of what knowledge is needed for the future. The past report makes it easier to deal with and predict the attack. Experience can help the action taken faster [26, 31].

For Malicious attacks, performance appraisal or peer review can help the team to be more aware of the relationship between teammates and the working condition. Employees can have some issues with one another or maybe with the higher-ups, and this can lead to possible attack; for example, one of the interviewees said that one of her colleagues that has an issue with the other team conveyed her discomfort with person A and in the end, some arguments involved unnecessary department because of assumption. This resulted in the leak of the organization's internal issues and working process, which led to the department's image being scarred. Technical approaches can be used to protect the data and the system; some approaches are mentioned in [2, 4-5]. In this research, the direct approach analyzed is the behaviour approach. There are some methods in the past research that are already studied and can be developed to adapt to the company. From this research analysis, the approach suggested is leaning toward detecting employee behaviour as an individual that interacts with the environment.

The third question regarding the challenges is that an organization might face implementing a system that is aware of cyber security. The interview shown that most companies, especially those unrelated to cyber security, put their priorities on their project. This can cause negligence in the building of the prevention system. Some companies tackle this issue by using 3rd party firms, which can take less time and focus but might cause more costs. Participants also conveys their discomfort with too many policies, while the other participant counterfeits with that comment. The ability of each employee to accept the policies might vary this will takes time to adjust. Policies must be formed according to the company's needs [2, 35]. The company should give time to the employee to adjust to the system yet still set a limit for the adjustment to prevent a prolonged process that can cause vulnerabilities [28]. The other challenge is the need for the company to follow the improvement of technology since it might affect the competitive advantage.

Last will be what recommendations could be made to assist organizations regarding cyber attacks going

forward?

- o Company can give more awareness for the employee about cyber-security through training.
- o Develop a performance appraisal system to improve the employee performance and support their well-being
- o Do not underestimate the attack scope, avoid developing a system after the issue happened
- o Provide prevention and countermeasure that are suitable for the company instead of following the trends

V. CONCLUSION

Reflection

Knowledge, skill, and passion are essential to support research. However, the research process is also the time to learn and develop. At the beginning of composing this research, the researcher had some basic knowledge related to the topic; most of it was gained from the other module taken in the past or courses are taken based on interest. This basic knowledge then turns into good, which drove the researcher to do this research. Not only gaining new skills, but the process also broadens the researcher's network and public speaking confidence. The use of NVIVO in this research is not direct, but it helps with coding for the interview result.

Time management skills are needed with time constraints and other projects in progress. From the beginning until half of the process, the author experienced difficulties in ensuring that the research progress proceeded according to schedule. The schedule was organized in the timetable with the target set from the beginning, but in practice, challenges arose, whether technical, health, or wellbeing. With the amount of past research that needed to be reviewed, the time it took exceeded the estimated time. For this matter, the researcher learned that limiting the amount of research is probably required. This issue is also solved by using a literature review matrix which helps compare and review faster and tidier.

Reconnecting with people and being more confident in engaging in a conversation is also benefits the researcher gained. Moreover, doing in-depth interview help the researcher to understand and sympathize more. Since this research is related to the behavioural aspect, the researcher, who had a limited knowledge and experience in the psychological field, managed to gain more in this topic and develop an interest in this matter [14, 15]. Therefore, the researcher feels grateful for the experience

gained from this research despite the challenges that the researcher has to face in the process.

Limitation and Managerial Implication

However, there are a few drawbacks that should be considered. Because qualitative data was created for a different purpose and audience, it's sometimes difficult to address research questions directly. The use of semi-structured interview help the researcher to gain a more prosperous point of few; however, this method of narrowing the interpretation, relating it to the topic and comparing the answer to other participant takes more time [7]. With limited time, the sample that could be interviewed was also limited. Conclusion and findings are easier to find since the sample is narrow, but it would be nice to have more samples for a richer result. The method used is suitable for this research since this research aims to understand the behavioural aspect in depth rather than quantity [20]. The findings in this research are meant to give the owners and researchers possible topics and issue to discuss based on information gained directly from direct interaction with employees that can be addressed for future use [6]. The findings meant not to contradict or challenged textual theory, rather to find gaps between those theories and the practice [17, 21, 28].

Although, it is possible to gain information from a quantitative approach where a questionnaire can be used to gain common opinion. During the interview, data collected can be limited, and some questions might not be answered accordingly; respondents may not feel they could openly discuss their experiences [7, 16]. Some respondents believed they lacked the competence to make valuable solutions to the questions posed. With the simplified framework in this research to save time, the researcher would recommend for future research analyze broader scope [12]. The sample could also be added and taken from a more specific field. The sample can be arranged based on the hierarchy when the participants are enough. If possible, the interview can be accompanied by field observation since the pandemic is decreasing. The analysis can be improved by using a more detailed questionnaire that is interview-based.

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Paper 78

The effects of human resource practices on agility and distribution support competencies (an empirical study of logistics service provider in Indonesia)

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ICMEM

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Abstract - Indonesia logistics industry has the greatest potential in the world, with over 200 million people, a huge number of trade agreements, growing e-commerce, and rising citizen purchasing power. This industry, however, has been hindered by a shortage of both quality and quantity of human resources employed in the sectors. To explore the effect of human resource practices have on logistics and supply chain competencies in Indonesia, this paper investigates the relationship between recruitment and selection, training and development, and reward management with the logistics and supply chain competencies of agility and distribution support. Data responses from 61 logistics service providers to a survey in 2022 were tested using hierarchical multiple regression analysis, which revealed recruitment and selection, as well as reward management only found to have a significant positive effect on agility competency. Whereas, training development has a significant positive effect only with distribution support. These results bring new insights that, in the Indonesian logistics sector, individual reward management can facilitate the development of agility, although it is considered a team-based competency. This highlights that LSP service levels in Indonesia are still based on individual effort, requiring effective and engaging individual reward management rather than team-based reward management.

Keywords - human resource management practices; logistics and supply chain competencies; Indonesia logistics industry

I. INTRODUCTION

Logistic sector is viewed as a crucial interface to increase the international trade and has an important role on countries economic growth and development [1]. In terms of activity level and expenditure, the logistic sector substantially is a people business [2]. Therefore, the performance of logistics companies and countries strongly influenced by workforce quantity and quality [3]. In developing countries, especially in Indonesia, the logistics industry plays an important role in balancing economic growth across the island. The state of Indonesia, which has 17,504 islands, 225 million people, and vast natural resources such as oil, gas, coal, and palm oil, influences Indonesia's attempts to develop an effective and efficient logistics system. The greater the effectiveness and efficiency of the logistics system, the more likely this industry will continue to

grow and contribute more to Indonesia's GDP (Gross Domestic Product) [4]. The logistics industry contributed IDR 881 663 billion to the Indonesian economy in 2019, accounting for 5.57 percent of GDP. Despite the fact that there is a decrease in 2020-2021 due to the COVID-19 situation [5]. The Indonesia's logistics industry is situated for growth due to trade agreements, ongoing improvements in transportation infrastructure, the growth of e-commerce, and rising buying power in the country. The logistics industry in Indonesia was estimated at US \$81.30 billion in 2020, and it is predicted to expand to US\$138.04 billion by 2026, with an annual growth rate of 9.22 percent throughout the forecast period [6]. Despite being a growing sector, logistics industry in Indonesia continues to experience a shortage of logistics experts, specialists, and professionals at both the management and operational levels. Jobs in this industry are not popular among students and recent graduates. Employees in logistics and supply chain management generally enter by "chance" owing to company's demand, rather than because developed their skills and competencies from the start. Therefore, it is difficult to recruit and select qualified employees in the logistic and supply chain industries in Indonesia. This points to the fact that the present human resources working in the logistics sectors are both limited of poor quality and quantity. As a result, the lack of logistical talent has become an issue that cannot be underestimated any longer because the human resources are the main key to the development of logistics and the national supply chain [7].

IT and human resources are two critical components that enable the logistics and supply chain to operate [8]. Due to the reliance on skills and competencies, human resources are critical in logistic and supply chain management. Despite its relevance, this area is understudied; just 4.5 percent of articles published in the three major logistics journals between 2001 and 2005 addressed HRM challenges. From 1998 to 2014, many researchers uncovered just 109 HRM-related articles in 12 SCM and logistics journals, with each journal publishing an average of 0.57 papers each year. According to their thorough review of the literature, 87 percent of these publications addressed on logistical competency challenges [15]. Previous SCM (Supply Chain Management) study in China discovered that HRM practices have a significant effect on logistics service operations [9] [10] [11]. The human resource practices such as recruitment and selection,

training and development, reward management, and performance management are suggested to China's LSPs in order to solve the problem of skill shortage and develop the company's logistics and supply chain competencies [10] [12] [13]. According to other research, human resource practices such as training, reward management, performance management, job design, and staffing are critical for establishing an integrated supply chain, which leads to improved overall supply chain performance in terms of cost, quality, delivery, and flexibility [17]. The literature on human resource management reports that skilled workforces would be a significant contributor to the service competency of logistics service providers in Asian countries [11] [12] [13] [14]. However, little study has been conducted on how LSPs employ human resources to develop L&SC (Logistics and Supply Chain) competencies [12] [16].

As a result, the primary objective of this study is to examine the effect of human resource practices on logistics and supply chain competencies in Indonesia. Primarily, this paper examines the relationship between recruitment and selection, training and development, and reward management with the logistics and supply chain competencies of agility and distribution support. This study aims to contribute to the creation of a long-needed knowledge base to tackle problems caused by skilled workforce shortages in the Indonesian logistics service industry and achieve greater organizational performance.

II. METHODOLOGY

A. Conceptual Framework and Operationalization of Item Measurements

The conceptual framework used in this study describes an expected relationship between the variables (independent, dependent, and control variables). The conceptual framework employed in this thesis has been tested by several authors [10][12][18].

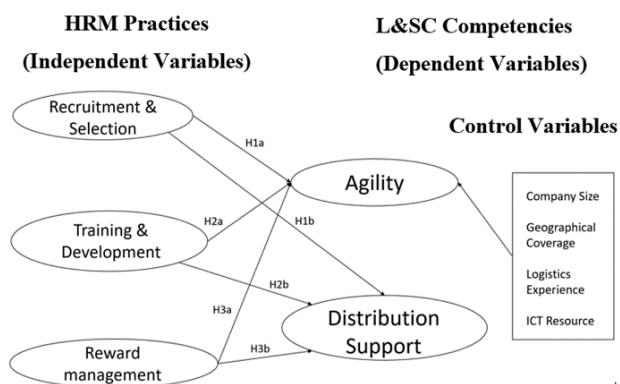


Fig.1 Conceptual Framework

Control Variables

As control variables in the data analysis, a five-item measuring construct of characteristics of company size (measured by the number of employees), geographical coverage (measured by the number of cities in Indonesia covered by operation), years of experience in the logistics industry, and ICT resource (measured by seven-point Likert Scale) are included in the data analysis potentially influence the L&SC competencies.

Dependent Variables

L&SC competencies are defined as the core capabilities that LSPs must establish using tangible or intangible resources to stay ahead of competitors by utilizing technological, production techniques, and management expertise to support the supply chain operation with cost-effective as well as high-quality products and services [16]. As a dependent variable, the L&SC competencies of agility and distribution support are measured using a five-item measuring construct. Each item of the construct was scored on a seven-point Likert scale (from "Strongly disagree" to "Strongly agree").

Independent Variables

HRM practices are defined as a set of distinct but interconnected activities, functions, and processes aimed at attracting, developing, and maintaining (or removing) intangible resources that contribute to sustained competitive advantage through firm-specific knowledge and competencies embedded in a firm's history and culture [19]. The authors used a fifteen-item construct to assess three key (recruitment and selection, training and development, and reward management) of human resource practices. All constructs followed the seven-point Likert-type question format.

Table 1 - DESCRIPTIONS OF VARIABLES

Variables	Items in the questionnaire	Code	References	Measurement
Agility	We are capable of delivering quick shipment to meet customer needs	A1	Stank and Lackey, 1997; Swailey et al., 2006; Shang and Marlow, 2007; Cho et al., 2008; Ding et al., 2012 and 2015	Perception measured on a 7 point Likert Scale: 1 = strongly disagree; 7 = strongly agree
	We are capable of providing rapid response to customer requests	A2		
	We are capable of arranging a flexible delivery schedule to fit with customer's schedule	A3		
Distribution Support	We are capable of providing widespread or extensive distribution coverage	DS1	Morais et al., 1996; Cho et al., 2008; Qureshi et al., 2008; Ding et al., 2012 and 2015	
	Our transport and distribution network has helped customers achieve cost saving	DS2		
Recruitment and selection	The recruitment and selection processes in this company are unbiased	RS1		
	Interview panels are usually used during the selection and recruitment process in our company	RS2	Ding et al., 2015; Fung et al., 2011; Islam and Sienghali, 2010	
	Our recruitment and selection process fit the candidates with the jobs	RS3		
Training and development	Our company plans the training programs as each job needs	TD1		
	Employees are trained in logistic and supply chain management as well as related courses	TD2	Delaney and Huselid, 1996; Ding et al., 2015; Kam et al., 2010; Kitchot et al., 2020; Ou et al., 2010	
	The company evaluates the success of the training and development program	TD3		
	The company provide career development opportunities to employees	TD4		
Reward management	My organization relates to compensation system with the level of knowledge and skill acquired by employees.	RM1	Ding et al., 2015; Islam and Sienghali, 2010; Kitchot et al., 2020	
	We offer attractive salaries to employees	RM2		
	We offer attractive welfare packages to employees	RM3		
Control Variables:				
Company size	Number of employees in Indonesia	CS	Wu et al., 2006; Kam et al., 2014	Number
Geographical coverage	Number of cities in Indonesia covered by operations	GC	Bolton and Wei, 2003; Ding et al., 2015; Fung et al., 2005; Qureshi et al., 2008	Number
Logistics experience	Years of experience operating in the Indonesia logistics market	LR	Ding et al., 2015; Hong et al., 2004	Years
ICT resource	Our information systems are sufficiently secure for business transaction	ICT1	Ding et al., 2015; Kam et al., 2010	Perception measured on a 7 point Likert Scale: 1 = strongly disagree; 7 = strongly agree
	Compared to our competitors, we invest more on computer hardware and software	ICT2		

B. Research Hypothesis Development

The hypotheses presented in this study are based on prior research in the field of human resource management and performance, which used logistics and supply chain competencies as determinants of organizational performance in the context of logistics supply chain operations.

Hypothesis 1

Recruitment and selection have been recognized as one of the most challenging problems in the Indonesian logistics industry. Jobs in this sector are unpopular among students and recent graduates, and most employees enter solely by chance [7]. The current study examines agility competency as a firm's ability to meet customer demands in a rapid manner [12]. Past research found in China's logistic sector, that there is a relationship between workforce and organizational agility in order to manage such a dynamic competitive logistic industry. Another study found recruitment and selection positive significant relationship with agility competency [12] [20]. Therefore, the previous research has stated that recruitment and selection has a positive influence on agility competency.

Hypothesis 1a (H1a): Recruitment and selection has a

significant positive effect on agility competency for Indonesian LSPs.

Inadequate distribution activities would be a barrier for LSPs embarking on supply chain operations in Indonesia. This situation has a negative impact on companies' competitiveness [4]. This study defines distribution support competency as a company's ability to successfully provide vast spatial reach in freight distribution and delivery. By hiring experienced logistics specialists, they will be able to handle freight transport logistics in a cost-effective manner, which is critical. Past research reported recruitment and selection are important contributors to the growth of distribution support competency [12].

Hypothesis 1b (H1b): Recruitment and selection has a significant positive effect on distribution support competency for Indonesian LSPs.

Hypothesis 2

The need for skilled logisticians highlights the challenge of skills and labor supply in Indonesia's logistics sector. Employers, on the other hand, seek to hire qualified personnel from the open market rather than spend on training [21]. However, training and development are necessary for situations where skilled workers are in low supply. Training enables employees to develop an understanding of companies' logistics operations and serves as a tool for developing capabilities and competencies. Career development should be established so that individuals may advance their careers inside the firm. A lack of professional development opportunities would make it difficult for LSPs to retain their employees. Previous research found a significant positive association between training and development and agility and distribution support competency [12].

Hypothesis 2a (H2a): Training and development has a significant positive effect on agility competency for Indonesian LSPs.

Hypothesis 2b (H2b): Training and development has a significant positive effect on distribution support competency for Indonesian LSPs.

Hypothesis 3

Rewards are important motivators for attracting and retaining highly skilled employees [22]. Companies in the logistics industry should evaluate their market compensation levels on an annual basis to ensure that they are paying market-competitive rates [15]. In comparison to other industries such as information and communication, financial services and insurance, and

power and gas procurement, the average salary paid by Indonesian LSPs is significantly lower. There is a minimum pay level legislation in Indonesia, although this does not indicate that all employees are rewarded in compliance with this guideline [23]. The shortage of qualified workers in Indonesia's fast-growing logistics sector has highlighted the necessity of a competitive compensation and benefits package in recruiting and maintaining top talent. As a result, the author proposes:

- Hypothesis 3a (H3a) : Reward management has a significant positive effect on agility competency for Indonesian LSPs.
- Hypothesis 3b (H3b) : Reward management has a significant positive effect on distribution support competency for Indonesian LSPs.

C. Data Collection and Sample Profile

The data for this study analysis was obtained from a survey of Indonesian L&SC firms undertaken in 2022 and chosen from the list of ILFA/ALFI's (Indonesian Forwarders and Logistics Service Providers Association). A total of 201 Indonesian logistics companies were identified from information provided by the ALFI database. 126 of the 201 email invitations issued were discovered to be no longer in operation, decreasing the effective sample size to 79 LSPs. A total of 65 completed surveys were received, with an overall response rate of 82%. Four (4) of the returned surveys were eliminated after data verification, leaving a final sample of 61 Indonesian LSPs for this study. The questionnaire was distributed to a key single informant, who is responsible for informing their organization of L&SC competencies and is familiar with the firm's broad range of human resource management practices.

D. Data Analysis

To analyze data in this study, descriptive analysis, reliability tests, validity tests, classical assumption tests of multiple regression, and hierarchical multiple regression were used. The descriptive analysis is used to explain the responding companies' profiles. To check internal consistency and validate all measurement variables, the reliability and validity test is performed. The classical assumptions of multiple regression tests such as linearity, homoscedasticity, normality, independence of the error distribution, outliers, and multicollinearity were checked prior to doing a hierarchical multiple regression analysis to test hypotheses.

III. RESULTS

This section presents the data analysis and findings. The sample profile is presented first as a result of descriptive analysis, followed by a discussion of the validity and reliability tests used to analyze and verify the measurement models, and subsequently a discussion of findings for fulfilling the assumptions testing for multiple regression models in using hierarchical regression analysis. Finally, the results of the hierarchical multiple regression analysis performed to test the hypothesized model are assessed.

A. Descriptive Analysis of Responding Firms

Table 2 - PROFILE OF RESPONDING LSPS

Key informants' position		LSPs annual revenue in 2021	
Vice president or above	41.0%	<Rp500.000.000	3.3%
Senior Manager	27.9%	Rp500.000.000 - Rp 1.000.000.000	8.2%
Junior Manager	31.1%	Rp2.000.000.000 - Rp10.000.000.000	9.8%
		Rp11.000.000.000 - Rp50.000.000.000	16.4%
		Rp51.000.000.000 - Rp100.000.000.000	13.1%
		Rp>100.000.000.000	49.2%
Years of experience in logistics industry		Ownership	
3-5	16.4%	Foreign-owned	4.92%
6-10	18.0%	State-owned	13.11%
11-15	14.8%	Private	81.97%
>15	50.8%		
Number of full time employees		Number of cities covered in Indonesia	
0-50	31.1%	1-5	23.0%
51-100	16.4%	6-10	11.5%
101-499	31.1%	11-15	4.9%
500-999	8.2%	16-20	6.6%
>1000	13.1%	>20	54.1%
Customer's Industry*		Types of logistics services*	
Automotive	57.4%	Transportation	88.5%
Fast moving consumer goods (FMCG)	57.4%	Warehousing	72.1%
Consumer electronics	49.2%	Distribution	67.2%
Food & beverage	47.5%	Freight forwarding	62.3%
Chemical material	44.3%	Logistics information systems	52.5%
IT and Telecom	31.1%	Value added-services	44.3%
Apparel and textile	29.5%	Inventory replenishment and control	42.6%
Agriculture	21.3%	Others	23.0%
Mining	11.5%		
E-commerce and marketplace	8.2%		
Retail	4.9%		
Medical equipment	3.3%		
Steel	3.3%		
Others	21.3%		

Notes: a: The total percentages in this section do not add up to 100 percent because multiple categories are allowed.

Based on Table 2 above, the majority of participants from the 61 responding LSPs held Vice President or higher levels (41%). This shows that the participants from the responding businesses had adequate knowledge to complete the questionnaire accurately and reliably. Most of the responding LSPs have private ownership (81.97%). More than half (50.8%) of the responding LSPs were in operation more than ten years ago. According to Law No. 20 of 2008, 49.2 percent of LSPs produced more than Rp100.000.000.000 in income, which fell in the major firms (annual sales of more than 50 billion). The percentages for the number of full-time employees are the same, at 31.1 percent for LSPs with 0 to 50 employees and 10-499 employees. Over half of the LSPs in Indonesia (54.1%) operate in more than 20 cities, indicating that the majority of responding LSPs operate on a large scale. Transportation, warehousing, and distribution, are the three major logistics services offered by these firms. These firms primarily serviced consumers in the

automotive, fast-moving consumer goods, and consumer electronics industries.

B. Validity and Reliability Test Results

Validity Test Result

The questionnaire in the form of a Likert scale provides ordinal data for that reason the validity test is performed for each item of the statement using the Spearman's Rank Correlation static technique (Spearman Rho) [24]. The testing is carried out by correlating the item score of each statement item with the total score, and after that interpreting the resulting correlation coefficient; if the correlation of each factor is positive and the magnitude is greater than 0.3, it can be concluded that the instrument has good construction validity [25].

Table 3 - RESULTS OF VALIDITY TEST

Variables	Code	R	Critical Value	Conclusion
ICT Resource	ICT1	0.811	0.3	Valid
	ICT2	0.891	0.3	Valid
Recruitment and selection	RS1	0.852	0.3	Valid
	RS2	0.834	0.3	Valid
Training and development	RS3	0.716	0.3	Valid
	TD1	0.887	0.3	Valid
Reward management	TD2	0.847	0.3	Valid
	TD3	0.919	0.3	Valid
Agility	TD4	0.718	0.3	Valid
	RM1	0.845	0.3	Valid
Distribution support	RM2	0.947	0.3	Valid
	RM3	0.927	0.3	Valid
Distribution support	A1	0.912	0.3	Valid
	A2	0.907	0.3	Valid
Distribution support	A3	0.932	0.3	Valid
	DS1	0.867	0.3	Valid
	DS2	0.891	0.3	Valid

The validity testing results shown in Table 3 demonstrate that the validity test findings of all research variables were all valid, hence no research variables were eliminated ($R > 0.3$).

Reliability Test Result

Cronbach's alpha utilizes to measure reliability, noting that a value greater than or equal to 0.70 demonstrates internal consistency among the items.

Table 4 - RESULTS OF RELIABILITY TEST

Variables	Code	Cronbach's α	Critical Value	Conclusion
ICT Resource	ICT1	0.715	0.7	Reliable
	ICT2	0.7	0.7	Reliable
Recruitment and selection	RS1	0.7	0.7	Reliable
	RS2	0.711	0.7	Reliable
Training and development	RS3	0.7	0.7	Reliable
	TD1	0.7	0.7	Reliable
Reward management	TD2	0.856	0.7	Reliable
	TD3	0.7	0.7	Reliable
Agility	TD4	0.7	0.7	Reliable
	RM1	0.7	0.7	Reliable
Distribution support	RM2	0.892	0.7	Reliable
	RM3	0.7	0.7	Reliable
Agility	A1	0.7	0.7	Reliable
	A2	0.911	0.7	Reliable
Distribution support	A3	0.7	0.7	Reliable
	DS1	0.756	0.7	Reliable
	DS2	0.7	0.7	Reliable

Table 4 shows the results of the reliability analysis revealing that each item of measurement constructs human resource practices (recruitment and selection, training and development, and reward management), logistics and supply chain competencies (agility and distribution support) and control variable of ICT resources are reliable (> 0.7). As a result, after passing the validity and reliability tests, the data could be processed to perform a hierarchical multiple regression analysis.

C. Assumption of Multiple Regression Test Result

Before conducting the hierarchical regression analysis, all independent variables were tested to ensure that they did not infringe the outlier, multicollinearity, normality, linearity, and homoscedasticity assumptions, as well as the sample-to-independent variable-ratio criteria [26].

The normality of agility and distribution support variables was assessed using the Kolmogorov-Smirnov test, which revealed that both the residual data acquired followed a normal distribution ($D = 0.106, 0.139$, sig 0.494, 0.192, respectively for each variables sig > 0.05). There were no univariate outliers (standardized residual more than or less than 3.3) and no multivariate outliers according to the value of Mahalanobis distance (critical value ≥ 24.32). The Tolerance and VIF values acquired as part of the regression program were examined for multicollinearity. Tolerance (>0.1) and VIF (<10) values for the three independent variables were all acceptable, showing no indication of multicollinearity or singularity. The Glejser test was used in this study with overall results revealed the data (sig > 0.05) meet the homoscedasticity assumption. A linearity test determined using the ANOVA table revealed a p-value of linearity is less than the significance level of 0.05 indicating there is a linear relationship between independent and dependent variables. A total of 61 responses would result in a ratio of 10.2 observations per

independent variable, above the minimum of 5 observations per independent variable set by [26]. In a conclusion, all of the preceding tests show that the acquired data satisfied the assumptions of regression analysis.

D. Hypothesis Testing

Hierarchical Multiple Regression Result

As all of the preceding assumptions have been fulfilled, then analysis was conducted to evaluate the hypotheses using the hierarchical multiple regression method to test the conceptual model. Hierarchical or sequential multiple regression is another common method of multiple regression, which is applied to test the regression model in an explanatory manner. This methods allows the independent variables enter the equation in an order specified by the researcher. The researcher normally assigns order of entry of variables according to logical or theoretical considerations [27].

In executing a hierarchical multiple regression analysis, all variables in this study models were added in two different blocks/models. The two separate hierarchical regression analyses were conducted to do hypothesis testing by using separately, agility and distribution support as the dependent variables. First, as model 1, the four control variables, company size, geographical coverage, logistics experience, and ICT resources were brought into the regression. According to the resource-based view theory [19], HR practices will be a competitive advantage if they are difficult to imitate. Consequently, large firms may have an advantage when it comes to resources over smaller firms. Therefore, the author included company size, geographical coverage, logistics experience, and ICT resources as the control variables. In model 2, the three independent variables (recruitment and selection, training and development, and reward management) were entered subsequently into the two regression equations.

Table 5 - HIERARCHICAL MULTIPLE REGRESSION MODEL RESULT

	Agility		Distribution Support	
	Block 1	Block 2	Block 1	Block 2
<i>Control variables</i>				
<i>Company size</i>	-0,233*	-0,256**	,149	,143
<i>Geographical coverage</i>	0,139	0,177*	,041	,058
<i>Logistics experience</i>	0,130	0,149	-,086	-,016
<i>ICT resource</i>	0,437***	0,277**	,256*	,083
<i>Independent variables</i>				
<i>Recruitment and Selection</i>		0,252*		-,001
<i>Training and Development</i>		0,055		,460***
<i>Reward Management</i>		0,278*		,170
<i>R²</i>	0,270	0,516	0,088	0,395
<i>Adjusted R²</i>	0,218	0,452	0,023	0,315
<i>R² Change</i>	0,270	0,245	0,088	0,307
N	61	61	61	61

Notes: Figures shown are standardised coefficients (i.e. beta values).

*p < 0.10; **p < 0.05; ***p < 0.01.

The results shown in Table 5 indicate while no particular hypotheses were set for the control variables, it was revealed in Block 1 that company size had a negative significant correlation with agility ($\beta = -0.233$, p 0.10), and so the independent variables were put into the regression ($\beta = -256$, p 0.05) in Block 2. When independent in Block 2 is entered, the geographical coverage ($\beta = 0.177$, p < 0.10) exhibits a significant positive relationship with agility. Logistics experience has little bearing on agility and distribution support on either block. ICT resources had significant relationships with agility and distribution support. For Agility, the ICT resource had significant relationship for both of Block 1 ($\beta = 0.437$, p < 0.01) and Block 2 ($\beta = 0.277$, p < 0.05). However, It is noted that ICT resource has a significant positive effect on distribution support ($\beta = 0.256$, p < 0.10) in Block 1 and became insignificant when independent variables were entered in Block 2.

As the independent variables were included in the model in Block 2, the results indicate that only agility ($\beta = 0.252$, p < 0.10) has a significant positive effect on recruitment and selection, confirming hypotheses H1a but rejecting hypotheses H1b. According to the findings, recruitment and selection are critical for Indonesian LSPs to establish agility competency. Training and development have a significant positive effect on distribution support ($\beta = 0.460$, p < 0.01) but have no effect on agility. As a result, the data support Hypothesis H2b but not Hypothesis H2a. Per the findings, training and development are critical for Indonesian LSPs to achieve distribution competency. The reward management had a significant positive effect on agility ($\beta = 0.278$, p 0.10) but did not affect distribution support, indicating that Hypothesis H3a is confirmed but Hypothesis H3b is not. The findings show that reward management is crucial for Indonesian LSPs to develop agility competency.

Table 6 - SUMMARY OF THE RESEARCH HYPOTHESIS RESULTS

Hypothesis	Research Hypothesis	Results	
		Positive and significant	Support
H1a	Recruitment and selection has a positive effect on agility competency for Indonesian LSPs.	Positive and significant	
H1b	Recruitment and selection has a positive effect on distribution support competency for Indonesian LSPs.	Negative and insignificant	Reject
H2a	Training and development has a positive effect on agility competency for Indonesian LSPs.	Positive and insignificant	Reject
H2b	Training and development has a positive effect on distribution support competency for Indonesian LSPs	Positive and significant	Support
H3a	Reward management has a positive effect on agility competency for Indonesian LSPs	Positive and significant	Support
H3b	Reward management has a positive effect on distribution support competency for Indonesian LSPs.	Positive and insignificant	Reject

According to Table 6, only three of the six hypotheses tested had positive and significant results.

IV. DISCUSSION

Control Variable Effects

There are four key findings of the effect of control variables on the dependent variables. First, the study reveals that the influence of company size is statistically significant negative on agility but its effect on distribution support is not significant. This finding reported that the LSP size has no major effect on the strength of distribution competency or the LSPs' ability to offer customer distribution support in Indonesia's logistics operation. On the other hand, the agility competency is affected by the size of the LSPs. This finding is consistent with the findings of [12], who discovered that the larger the firm size of LSPs, the less agile the firm. Larger LSPs are less responsive to changing market conditions or customer demand than smaller sizes LSPs. Smaller LSPs may have a benefit in developing agility competency when compared to larger firms. In terms of operational operations, smaller businesses are easier to manage than larger businesses [28].

Second, the results show geographical coverage has a significant positive effect only on agility competency. It confirms the previous findings [12] [29] [30]. All these studies reveal that having widespread or global distribution coverage is a key to competing in the logistic market. This finding suggests that geographical coverage is vital to the development of L&SC competencies in the Indonesian market. It is an essential element of competing since Indonesia's geographical conditions present possibilities and difficulties for the national logistics system. Geographically, Indonesia has approximately 17,000 islands, making it difficult to deliver the commodity throughout the country.

Third, the findings revealed logistical experience has no significant impact on the development of logistics and supply chain competencies. This finding implies that, in the context of Indonesia's logistics operations, logistics expertise has minimal impact on the strength of its agile competency or its potential to provide distribution assistance to customers. This discovery is consistent with the previous findings [12].

Fourth, the findings revealed that ICT resources have a significant positive effect on agility and distribution support, ICT has become critical for LSPs to respond to market volatility and improve their regular operations. This result supports some of the previous studies [12] [31]. In Indonesia, the extent of ICT platform development to enable tracking and monitoring systems varies amongst logistics service providers (state-owned company and

private) contrasted with the global logistics service providers [31].

Human Resource Practices Effects

This study's findings support hypotheses H1a, H2b, and H3a, but reject hypotheses H1b, H2a, and H3b. According to the findings of this hypothesis, present human resource practices in Indonesia's logistics industry have a mixed impact on the development of logistics and supply chain competencies. These findings raise numerous intriguing aspects that are worth further discussion.

First, recruitment and selection have a statistically significant positive effect on agility competency. This result is congruent with the previous findings which found that effective design strategies, policies, and procedures for recruitment and selection will create a unique source of competitive advantage for the LSPs and boost their agility competency [12]. Indonesian LSPs must create effective recruitment and selection procedures and processes capable of creating more competent logistic personnel and expertise. The dynamic of the Indonesian logistics sector's business climate will lead to determining the skills required to employ new employees for the company to provide speedy delivery services, build creative flexible delivery plans, and respond quickly to customer complaints to become an agile organization. The statistically insignificant negative relationship between employee recruitment and selection and distribution support competency in Indonesia could be interpreted as an indication that, rather than carrying out recruitment and selection practices to obtain skilled employees logistics companies can build their distribution linked with a wide area coverage to serve customers, the logistics companies prefer to form partnerships with other companies. Several Indonesian logistics companies have formed a partnership to improve their distribution network such as, PT Kereta Api Indonesia (Persero) worked with PT Banda Ghara Reksa on the supply of freight transport by train to support the BGR business, the exploitation of KAI's assets, and the usage of warehousing and depots container of BGR.

Second, training and development practices have a statistically significant positive effect on the distribution support. This study's findings are consistent with those of earlier studies [12] [33] [34]. This finding implies that an effective training and development program, policy, and procedure are more capable of enabling Indonesian LSPs to successfully offer extended geographic reach in freight distribution and delivery in order to assist consumers in distributing their products over a wide geographical location at very competitive rates. The distribution support competency, which is concerned with carrying out operational activities, requires a high level of

individual skill and effort. Individual efforts will be required for both white-collar and blue-collar workers, such as truck drivers, to complete the operational operations of freight distribution to a vast geographical region. Therefore, it is critical that Indonesian LSPs offer training and career development programs for both white and blue-collar personnel to enhance distribution support competency. On the other hand, the statistically insignificant effects of training and development on agility competency in the Indonesian logistics industry may be interpreted as evidence that regular training and development programs are not always effective in boosting LSP performance. This finding is consistent with [15] and [21]. In a survey among LSPs from emerging and developed regions, there is an inclination for some LSPs to perceive training as a cost instead of an investment because the benefits are difficult to measure, despite the fact that training has been shown to be beneficial in both economic and managerial aspects. There is evidence that Indonesian LSPs frequently choose to hire experienced personnel from the open market rather than spend on training [15].

Third, the notable findings of this study is reward management has a statistically positive and significant effect on agility competency. This finding is consistent with the majority of previous studies, which found a positive and significant relationship between reward management practices and organizational performance [34] [35] [36] [37] [38] [39]. According to this finding, reward management conducted by Indonesian LSPs appears to be focused directly on individuals rather than teams, but still, has a major influence on agility despite being regarded as team-based competency. This was aligned with the business service levels provided by Indonesian LSP which, according to [7], primarily offered basic logistics services. Only a small number of these LSPs have offered value-added services. This highlights logistics companies in Indonesia tend to be dominated by basic services instead of value-added services that need strong employee teamwork. For that reason, this indicates that in Indonesia, logistics companies take a greater concept of individual reward management rather than team reward management since their level of services is still based on individual effort, which necessitates effective and appealing individual reward management rather than team-based reward management. In contrast, the insignificant effect of reward management on distribution competency may interpret as LSP's ability to successfully distribute goods across a large geographical area is heavily influenced by the distribution system [40]. According to a [41] assessment, the overall length of Indonesia's categorized road network in 2017 was stated to be 532,837.9 km, with the majority of it handled at the district (80.5 percent) and provincial levels (10.5 percent). Only 60% of these subnational roads are concrete, and a

considerable portion is not in excellent shape. The national road network has not kept up with rising demand, resulting in a capacity backlog. As a result of weak connectivity and high transportation costs, Indonesia's productivity and competitiveness have suffered. On worldwide indexes of transportation infrastructure and logistics performance, Indonesia falls below regional peers. In the 2018 Global Competitiveness Index, Indonesia ranks 75th out of 140 nations in terms of road quality, after Malaysia (20), China (42), India (51), and Thailand (55). Therefore, even though there is an attractive salary, benefits, and welfare package, the Indonesian LSPs will continue to face challenges to deliver the product into a wide geographical area due to various issues such as logistics infrastructure, regulations, policies, and logistics costs.

V. CONCLUSION

In order to tackle the problem of shortage of logisticians in terms of quality and quantity in the Indonesian logistics industry, this research intends to examine the impact of human resource management practices on agility and distribution support competencies in the Indonesian logistics industry. This research explores whether and how human resource practices contribute to enhancing the logistics and supply chain competencies as the indicator of organizational performance in the context of logistics and supply chain operations.

This study discovered that recruitment and selection, as well as reward management, appear to be critical practices for developing agility competency [12] [34] [35] [36] [37] [38] [39] [42]. While training and development appear to be reinforcing the development of Indonesian LSPs' distribution support competency [12] [33] [34]. It was concluded that effective recruitment and selection strategies will eliminate skills gaps or skill mismatches, giving the logistics organization a greater chance of hiring competent talent personnel, which is required to enhance agility competency. The findings also showed that reward management can benefit Indonesian LSPs in developing agility competency. Being an agile organization is dependent on the organization's competent workforce. The training and development program related to the core of the logistics and supply chain such as distribution and transportation, warehousing, and inventory management in upgrading of workforce skills as to give a better opportunities to develop their career, thus lead to the increase of distribution support competency.

Managerial Implications

The present study enables managers to enhance the organizational performance through the use of human resource practices in order to solve the shortage of logistics employee and skilled or expertise logistics

employees in Indonesia logistics sector. The positive effects of recruitment and selection on agility imply the manager must develop effective recruitment and selection policies, and methods because in order to develop agility depends on how many the skilled talent the logistics company have.

The positive effects of training and development on distribution support suggest the managers to ensuring that the training program is attributed to the core of logistics and supply chain, as well as assure that the activities of the training program are based on the training analysis need and meet the needs of both white-collar and blue-collar employees, and providing career opportunities for all level of job levels.

Reward management systems appear to reinforce the growth of agility competency, this implies that the managers should able to offer a fair, competitive, and attractive salary and welfare package for individual reward management because it helps Indonesian LSPs to recruit the skilled and expertise employees.

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Paper 79

Exploring the mechanism of work engagement and individual adaptive performance (Case of Media and App Development Companies)

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Abstract - Due to the ongoing global pandemic, a massive business and work practice transformation is required. Therefore, employees' adaptive performance has assumed greater importance in helping organizations to survive in the contemporary turbulent commercial environment. This paper aims to examine the mechanism between work engagement and individual adaptive performance. The authors adopt a mixed-method research methodology incorporating a case-study approach. The study initially explores the context and mechanism of work engagement and individual adaptive performance through a qualitative approach involving semi-structured interviews the results of which are, subsequently, validated quantitatively by means of a survey. The results indicate that work engagement is become a significant determinant of employees' training and learning. The importance of maintaining work engagement in order to develop human capital with higher creativity, interpersonal and professional adaptability and active involvement in learning, especially during the ongoing pandemic, is evident.

Keywords – work engagement, adaptive performance, case-study, mixed-method

I. INTRODUCTION

The research conducted into individual adaptive performance has increased year on year. Moreover, the Covid-19 pandemic is driving largescale business and work transformation. Therefore, individual adaptive performance is playing an increasingly essential role in determining organizational agility [1]. Moreover, adaptive performance is one of the keys to continuously develop employee skills and capabilities in response to market demand [2].

On the other hand, to date, research exploring the individual adaptive performance mechanism to the concept of work-engagement remains limited [3];[4]. Work engagement here plays an essential role as a form of additional effort involving vigorous behaviour, dedication, and ability to adapt well and deliver more effective solutions in a dynamic work environment [5]; [4].

This research seeks to explore the mechanism between work engagement and individual adaptive performance within the context of the creative process. Therefore, a case study was conducted that focused on two digital

start-ups. These two companies are known as subsectors in the creative industries that have been profoundly affected by technology and market changes. Moreover, Charbonnier-Voirin et al., 2012 explained that the findings on individual adaptive performance measurements remain inconsistent [6]. Therefore, this research incorporated the use of a mixed-method approach to deliver clearer result.

II. LITERATURE REVIEW

The Relationship between Work Engagement and Individual Adaptive Performance. Neal & Hesketh first put forward the concept of adaptive performance in 1999 as an individual's ability to adapt to dynamic work situations[7]. Pulakos et al. (2000) subsequently built an individual adaptive performance scale developed a more consistent version of the scale through the application of a mixed-method approach[8]. Its dimensions comprise creativity, managing work-related stress, commitment to training and learning, and interpersonal adaptability.

However, limited research exists explaining the concept of adaptive performance through work en-gagement mechanisms. Schaufeli et al., (2006) argued that work engagement is a positive and ful-filling behavior, characterized by vigor, dedication, and absorption[9]. In 2010, Van den Heuvel et al. examined how it affects individual adaptive performance through personal resources [3]. They empha-sized that fully engaged employees tend to be creative, more productive, and willing to invest great-er effort their work through this concept. Therefore, it can be hypothesized that:

H1 : Work engagement positively influences individual adaptive performance.

II. METHODOLOGY

This research utilizes a case study methodology with a mixed-method approach and commences with an exploration of the context of work engagement and adaptive performance in two digital startups. At the exploration stage, semi-structured interviews with purposive sampling were conducted. A survey of 160 employees in the two companies was subsequently conducted by means of quota sampling. Data triangulation was carried out on qualitative data, while quantitative data was subjected to validity and reliability tests. Eight items from the Utrecht Work Engagement Scale [9] and

seven items from the Individual Adaptive Performance Scale by [6] were employed. To examine the relationship between work engagement and adaptive performance a linear regression test was completed.

III. RESULTS

A. Findings in First Digital Startup

As a cyber media enterprise, this company operates an active **collaboration** process between divisions. The production process and the inherent value of each product are based on the **knowledge and perspectives of several specialists** employed. The company's products are based on creative processes and, consequently, work engagement plays an essential role in **helping employees** to meet every requirement of their superiors with **innovative results**. Interpersonal ability to play is critical to the collaboration process's success both within the company and with external parties. Moreover, each employee's level of creativity is also essential, especially in terms of creating **innovations** which seek to **meet dynamic market needs**. The pressure of work within this company being both relatively intense and dynamic, employees must manage work stress and take reactive decision appropriately. Therefore, company employees need to improve **their skills** and abilities according to the current market needs. It can, therefore, be concluded that considerable investment in training and learning is necessary for each employee to adapt to market conditions and prevailing job demands.

B. Findings in Second Digital Startup

The company's production process, based on the collaboration of several specialists drawn from different divisions, can solve problems according to user needs. Therefore, **active collaboration** plays an important role in the success of the production process. Moreover, the rapid evolution of this company's products requires greater effort and adaptation to rapidly overcome **obsolete technology** and meet user needs. The work engagement context plays an important role in promoting the process of adaptation to market needs yet remains up to date due to rapidly changing technology. **Interpersonal skills** play an essential role in each individual's collaboration with and adaptation to changing markets and existing technology. It is evident that the organization requires every individual to be aware and taking immediate decision toward the new market needs and enhance their skills according to changing times. In addition, the management of work stress and individual creativity also determine the adaptation process involved in creating **more innovative products**.

C. The Result of Structural Equation Modelling

In the first step, we tested the model fit through PLS Algorithm. We found the outer loading values of seven items on the individual adaptive performance and eight items on the work engagement is above 0,6. Following the value of Cronbach-alpha above 0,8 and Average Variance Extracted is above 0,5. Based on the result, it is showed those items is valid and reliable (See Table 1)

Table 1 - THE CONSTRUCT VALIDITY AND RELIABILITY

Variable	Items	Outer loading	Cronbach's Alpha	AVE
Individual Adaptive Performance	IAP1	0,799	0,853	0,529
	IAP2	0,690		
	IAP3	0,741		
	IAP4	0,733		
	IAP5	0,752		
	IAP6	0,671		
	IAP7	0,699		
Work Engagement	WE1	0,610	0,867	0,525
	WE2	0,823		
	WE3	0,812		
	WE4	0,828		
	WE5	0,666		
	WE6	0,609		
	WE7	0,755		
	WE8	0,650		

Based on the result of PLS Algorithm is also found that the SRMR is below 0,09 and NFI is above 0,7. It is showed the goodness of fit model is accepted (See Table II).

Table 2 - THE GOODNESS FIT OF MODEL

Model Fit Criterias	Saturated Model
SRMR	0,076447744
Chi-Square	204,0113526
NFI	0,816597484

A significant relationship between work engagement and adaptive performance. The adaptive performance is contains of the dimension of creativity, interpersonal adaptability, learning, and training effort, handling work stress and reactivity (See Figure 1).

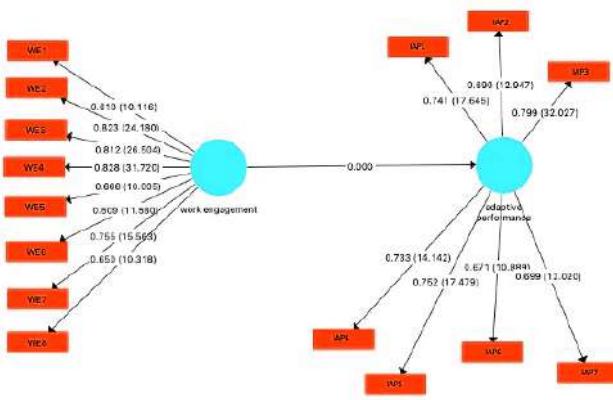


Fig. 1. The Result of Structural Equation Modelling

In details, it is showed that p-values the impact of work engagement toward adaptive performance is below 0.05. Therefore, the relationship between work engagement and adaptive performance is significant (See Table III).

Table 3 - THE RESULT OF REGRESSION

Relationship	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
work engagement -> adaptive performance	0,6226	0,0538	11,3312	0,00

C. Discussion

The main reason the employees have high adaptive performance is because of the high and dynamic demand from clients, the fast-shifting market behavior, and the rapid digital technological environment [10,11,12]. To cope with those challenges, employees must give more effort, time, and dedication [13]. Consequently, the state of employee work engagement becomes pivotal to maintaining high individual adaptive performance to deliver innovative products that align with those demands [14,15]. Moreover, the source of innovation in the creative product relies on collective ideas from the specialist [16]. Therefore, interpersonal adaptability has played an important role in maintaining the effectiveness of innovation in the product development process [17].

V. CONCLUSION

The qualitative findings of this research suggest that the organizational context of a dynamic market undergoing volatile technological change necessitates continual skill development through collaborative and active learning processes. Such processes are key to innovative product development. Furthermore, this study emphasizes the importance of companies managing their employees' level of work engagement in order to maximize their efforts in the areas of creativity, learning and training, collaboration with others, reactive with changes and new opportunities,

handling work stress. These four aspects become crucial to helping employees to adapt rapidly to massive changes in the external environment, such as the Covid-19 pandemic. Future research may involve more extensive samples to deliver improved and more profound results. Furthermore, future research may also explore the mechanism of work engagement and adaptive performance in the innovation process, especially within a co-creation context.

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Paper 80

Human Capital Readiness in Facing Industry 4.0 – Study Case Shared Services Finance at Energy Company, PT Perminyakan

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ICMEM

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Abstract- PT Perminyakan established a new organization named Shared Service Center (SSC) in 2018 as one of the embodiment of digital transformation of the company. SSC consist of four functions called multitower, they are Finance, IT, Human Capital and Asset Management. Shared Service Finance (SSF) provide services to stakeholders (customers, suppliers, and other function inside Perminyakan) in finance operation activities. In the daily job, SSF face many challenges, high volume and repetitive jobs are occurs every day. SSF helped by the management team that provide technologies industry 4.0 based to help and assist them in doing their daily activities. But the utilization of the tools is still low. Based on these problems, in this final project a research was conducted using a combination of quantitative and qualitative methods using questionnaire and equipped with semi-structured interviews to obtain data and information that will be included in the concept of Human Capital Readiness. Human Capital Readiness seen from four aspects: Knowledge, Hard Skill, Soft Skill, and Attitude. Furthermore, interviews were conducted to determine and give deeper information about the questionnaire result and gain insight about how company respond to the condition. SSF also has SIERA, it is an industry 4.0 based tool that develop by SSF itself. It uses Artificial Intelligence based technology. Writer also use the quantitative and qualitative method to find out the Human Capital Readiness of SSF in implementing SIERA. Furthermore, from Human Capital Readiness assessment that provide Human Development Index (HDI), a gap was used to determine some aspects that defined as ready, optimal, not ready. From the questionnaire and interviews that validate the questionnaire result, writer also give some recommendation of implementation plan to the company. The findings in this study are divided into two scopes. The first is about readiness to face the industrial 4.0, and the second is about the readiness in implementing SIERA. First scope give result that Knowledge and Soft Skill are not ready, but Hard Skill and Attitude are optimal. By this result, writer give recommendation to increase digital literation, upskilling and re-skilling, and culture development (digital leadership and digital mindset). Second scope give result that Hard Skill and Attitude are not ready, meanwhile Knowledge is optimal and Soft Skill is ready. Writer give three recommendations: upskilling, solve application issues and update, and aggressive branding for SIERA.

Keywords- Human Capital Readiness, Human Development Index, Industry 4.0, Artificial Intelligence, Shared Services Finance

I. INTRODUCTION

PT. Perminyakan is a state-owned enterprise in the energy sector which has a portfolio from upstream to downstream by supplying energy throughout Indonesia. To become world class energy company has been its vision, to call the future challenges in the energy sector. President Director of PT Perminyakan (Persero) said, "In line with taking several strategic steps. One of them is by establishing a Shared Services Center (SSC) which is part of PT Perminyakan's digital transformation." So, with the establishment of SSC in Perminyakan, it is one of an indicator that the company has commit to do digital transformation inside the organization in facing more challenging era, industry 4.0.

(Udovita, 2020) said that digital transformation is arise from the intersection of cloud computing, Big Data, IoT, and AI, and it is vital to industries across the market today. The term Industry 4.0 was first mentioned at the Hannover Fair in 2011, which refers to the industrial revolution 4.0. Currently, the world is witnessing the fourth industrial revolution. Since the start of the Industry 1.0 revolution in the 17th century until today, the entire world has gone through various stages of rapid industrial evolution with a rapid pace of technological change. Perminyakan establish SSC as one of the answer to face industry 4.0 in the future.

II. METHODOLOGY

This research methodology uses both quantitative and qualitative approach. Quantitative method approach using questionnaire that being spread to the SSF employees in Perminyakan and using the formula of Human Development Index. Meanwhile, the qualitative method approach conducted using interview method within SSF employees including management team. SSC being chosen because SSC is one of the industry 4.0 initiatives by PT Perminyakan that conduct operational activities to be simpler by utilizing some technology and has new business process design compare to old Perminyakan. SSC also increase Perminyakan human capital productivities. SSC utilize many technologies such as robotic automation, control the cybersecurity and cloud computing, and has develop a virtual assistant that to be intended as the first AI in the

company. The research method based on human capital questionnaire that being developed based on (Hendarman, Primatasya, Sufiadi, & Sonia, 2021) Researcher got 140 total respondents that is being gathered from February until March 2022. The questionnaire designed in online survey. Statistical analysis and interview method will be additional insight and perspective to support the data survey

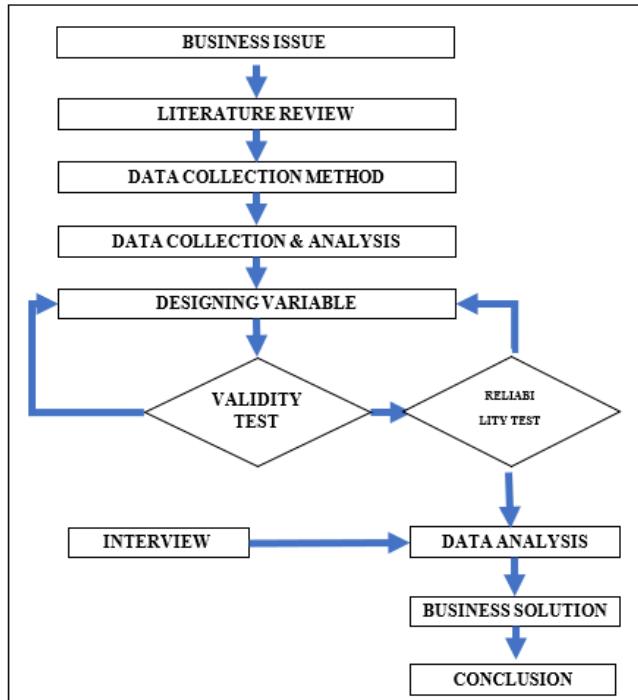


Figure 1: Methodology Framework

III. RESULTS

1. Human Development Index – Questionnaire

Based on Hendarman et al (2020a), Human Development Index calculated based on the gap to give depiction of readiness relativity interfactor after calculating the data reliability and validity.

Human Development Index formula can be calculated as follow:

$$\frac{X - \text{minimum value}}{\text{Maximum value} - \text{minimum value}}$$

Where,

X = gap value, expected value minus current condition value

Minimum value = smallest gap value

Maximum value = biggest gap value

Refer to the questionnaire list, writer aims are to find the HDI rate for every aspect: Knowledge, Skill and Attitude.

Here it is the Human Development Index (HDI) Range Value (both for assess the readiness to face industry 4.0 and the HDI of the readiness of SIERA implementation in the organization:

Table 1: HDI Range Values

Value Range	Level
0.00-0.20	Optimal
0.21-0.40	Receptive
0.41-0.60	Ready
0.61-0.80	Initial Stage Readiness
0.81-1.00	Not Ready

Reliability Test Result

Table 2: Reliability Result – HDI in facing industry 4.0

Assessment Aspect	Cronbach Alpha	Category
Knowledge		
<i>Existing</i>	0.875	> 0.60 (Reliable)
<i>Expected</i>	0.886	> 0.60 (Reliable)
Hard Skill		
<i>Existing</i>	0.908	> 0.60 (Reliable)
<i>Expected</i>	0.942	> 0.60 (Reliable)
Soft Skill		
<i>Existing</i>	0.921	> 0.60 (Reliable)
<i>Expected</i>	0.834	> 0.60 (Reliable)
Attitude		
<i>Existing</i>	0.743	> 0.60 (Reliable)
<i>Expected</i>	0.761	> 0.60 (Reliable)

Table 3: Reliability Result – HDI in implementing SIERA

Assessment Aspect	Cronbach Alpha	Category
SIERA Knowledge		
<i>Existing</i>	0.673	> 0.60 (Reliable)
<i>Expected</i>	0.692	> 0.60 (Reliable)
SIERA Hard Skill		
<i>Existing</i>	0.636	> 0.60 (Reliable)
<i>Expected</i>	0.809	> 0.60 (Reliable)
SIERA Soft Skill		
<i>Existing</i>	0.624	> 0.60 (Reliable)
<i>Expected</i>	0.823	> 0.60 (Reliable)
SIERA Attitude		
<i>Existing</i>	0.724	> 0.60 (Reliable)
<i>Expected</i>	0.831	> 0.60 (Reliable)

Factor Analysis (Validity Test) Result

Table 4: Validity Result – HDI in facing industry 4.0

Variable	Existing	r pearson	Expected	r pearson	Note
Knowledge	KE1	0.693	KH1	0.773	> 0.3 (valid)
	KE2	0.698	KH2	0.774	> 0.3 (valid)
	KE3	0.74	KH3	0.724	> 0.3 (valid)
	KE4	0.568	KH4	0.682	> 0.3 (valid)
	KE5	0.617	KH5	0.803	> 0.3 (valid)
	KE6	0.731	KH6	0.676	> 0.3 (valid)
	KE7	0.506	KH7	0.711	> 0.3 (valid)
	KE8	0.488	KH8	0.711	> 0.3 (valid)
	KE9	0.573	KH9	0.567	> 0.3 (valid)
Hard Skill	HSE1	0.735	HSH1	0.845	> 0.3 (valid)
	HSE2	0.667	HSH2	0.765	> 0.3 (valid)
	HSE3	0.741	HSH3	0.796	> 0.3 (valid)
	HSE4	0.726	HSH4	0.765	> 0.3 (valid)
	HSE5	0.635	HSH5	0.845	> 0.3 (valid)
	HSE6	0.765	HSH6	0.845	> 0.3 (valid)
	HSE7	0.715	HSH7	0.845	> 0.3 (valid)
	HSE8	0.69	HSH8	0.838	> 0.3 (valid)
Soft Skill	SSE1	0.752	SSH1	0.589	> 0.3 (valid)
	SSE2	0.754	SSH2	0.653	> 0.3 (valid)
	SSE3	0.736	SSH3	0.472	> 0.3 (valid)
	SSE4	0.607	SSH4	0.698	> 0.3 (valid)
	SSE5	0.788	SSH5	0.472	> 0.3 (valid)
	SSE6	0.736	SSH6	0.894	> 0.3 (valid)
	SSE7	0.756	SSH7	0.894	> 0.3 (valid)
	SSE8	0.814	SSH8	0.709	> 0.3 (valid)
Attitude	AE1	0.405	AH1	0.699	> 0.3 (valid)
	AE2	0.506	AH2	0.772	> 0.3 (valid)
	AE3	0.55	AH3	0.424	> 0.3 (valid)
	AE4	0.645	AH4	0.48	> 0.3 (valid)
	AE5	0.536	AH5	0.621	> 0.3 (valid)

Questionnaire Result

Table 5: Questionnaire Result

Aspect	No	HDI	Level
Knowledge	1	0.779	ISR
	2	0.716	ISR
	3	0.798	ISR
	4	0.538	R
	5	0.815	NR
	6	0.813	NR
	7	0.519	R
	8	0.596	R
	9	0.543	R
Hard Skill	1	0.548	R
	2	0.579	R
	3	0.736	ISR
	4	0.83	NR
	5	0.601	R
	6	0.42	R
	7	0.468	R
	8	0.378	Receptive
Soft Skill	1	0.788	ISR
	2	0.81	NR
	3	0.728	ISR
	4	0.611	ISR
	5	0.679	ISR
	6	0.829	NR
	7	0.596	R
	8	0.75	ISR
Attitude	1	0.555	R
	2	0.332	Receptive
	3	0.596	R
SIERA Knowledge	4	0.483	R
	5	0.718	ISR
	1	0.388	Receptive
SIERA Hard Skill	2	0.474	R
	3	0.609	R
	1	0.609	R

Aspect	No	HDI	Level
	2	0.651	ISR
	3	0.353	Receptive
SIERA Soft Skill	1	0.612	ISR
	2	0.423	R
	3	0.163	O
SIERA Attitude	1	0.644	ISR
	3	0.346	Receptive

Gap and HDI Findings

Table 6: GAP and HDI in Facing Industry 4.0

Aspect	Current condition	Expected	Gap	HDI	Category
Knowledge	4.059	4.940	0.886	0.901	Not ready
Hard Skill	4.341	4.976	0.635	0.007	Optimal
Soft Skill	4.042	4.951	0.909	1.000	Not ready
Attitude	4.285	4.917	0.633	0.000	Optimal

Table 7: GAP and HDI Value in implementing SIERA

Aspect	Current condition	Expected	Gap	HDI	Category
SIERA Knowledge	3.789	4.891	1.112	0.000	Optimal
SIERA Hard Skill	3.221	4.942	1.721	1.000	Not ready
SIERA Soft Skill	3.571	4.955	1.385	0.447	Ready
SIERA Attitude	3.189	4.888	1.699	0.963	Not ready

2. Interview Analysis

Writer also conduct interview process to ensure and support the questionnaire validity. The interview process conducted with expert in the organization. They are all the management team of the SSF personal in the organization. Their point of view as management team will give additional explanation how company overcome this industry 4.0 challenges. The interview conducted with semi structured method. According to (E. Newcomer, P. Hatry, & S. Wholey, 2015) Semi-structured interview conducted conversationally with one respondent at a time and employs a blend of closed – and open – ended questions, often accompanied by follow up why or how questions. The dialogue can meander around the topics on the agenda – rather than adhering slavishly to verbatim questions as in a standardized survey – and may delve into totally unforeseen issues.

Table 8: Summary of Interview Results

INTERVIEW QUESTIONS	SUMMARY OF RESPONSES
How is company commitment in giving knowledge to the employees about industry 4.0 and the implementation in SSC Finance? HDI result not ready	Commitment already shows by company with the programs such as POLS (PT Perminyakan Online Sharing) and some socializations. But some activities are still using conservative ways in terms of transition to the digital era.
Does company have programs to increase hard skill of the employees about industry 4.0 implementation in SSC Finance? HDI shows optimal result	Today many training, and courses related to industry 4.0 such as RPA (Robotic Process Automation) training, VIM (Vendor Invoice Management), SMARTGEP etc.
How company facilitate Soft Skill of the employees related to implementation of industry 4.0 technology? HDI shows not ready	Company facilitate the soft skill via online since the pandemic situation.
How is company programs to build attitude of the human capital related to industry 4.0 in daily work? HDI result shows optimal.	The Company's program in building a culture and attitude of industry 4.0 technology in daily work has led to increased automation, for example at SSF to process third party bills using softcopy and can be done anywhere without the need for physical documents, machine-to-machine communication, for example, question and answer with chatbots and web shared services are available FAQs that will answer questions about SS, God willing, in the future Chatbots will use AI technology, as well as sustainable technology development.
Does company commit to implement industry 4.0 and how do employees' commitment as the technology users?	Company already commit to implement the industry 4.0 in the daily activities, it is shown from the KPI of the management that already included industry 4.0 assessment.
About SIERA knowledge, HDI shows optimal, is it already as the same in the reality?	Yes, because SIERA knowledge already being socialized through many media in the company, such as broadcasts, sharing knowledge, and socializations.
HDI – Hard Skill aspect shows that employee are not ready regarding SIERA. Why it can be?	Because SIERA is a brand-new technology product in the company. Besides, many channels are provided before the launching of SIERA. Needs to build customer engagement and rebranding SIERA to improve SIERA positions and image to the stakeholders.
HDI Soft Skill aspect shows that SSC Finance employees are ready in implementing SIERA, is it already suitable with real condition?	Yes. If we don't adjust, we will be left behind than other companies.

What is your opinion regarding HDI – Attitude aspect that shows not ready? Do you think the organization support for development of Knowledge Management?	Many channels are still provided to help stakeholders. And this situation can be solved with more socializations and branding the SIERA itself to get intentions of the stakeholders.
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Hard Skill						- Do the reskilling regarding the industry 4.0 technologies that already used in the daily works and conduct upskilling for new technologies (besides the familiar ones).
	4.341	4.976	0.6 35	0	Optimal	- Conduct talent pool inside SSF function and involve them in some new technologies development. - Increasing desire to innovate, especially related to industry 4.0 tools, based on the daily experiences and problems - Conduct more sharing knowledge regarding how important industry 4.0 in our future
Soft Skill						- Do the reskilling regarding the industry 4.0 technologies that already used in the daily works and conduct upskilling for new technologies (besides the familiar ones).
	4.042	4.951	0.9 09	1	Not ready	- Conduct talent pool inside SSF function and involve them in some new technologies development. - Increasing desire to innovate, especially related to industry 4.0 tools, based on the daily experiences and problems - Conduct more sharing knowledge regarding how important industry 4.0 in our future
Attitude						- Give some broadcast how to check out digital devices daily to help employee checking their own devices in good way.
	4.285	4.931	0.6 46	0.04 01	Optimal	- Give some broadcast how to check out digital devices daily to help employee checking their own devices in good way.

IV. DISCUSSION

1. Human Development Index Solutions

Based on the measurement, questionnaire and the interview result, hereby writer provide some analysis, resulting in improvement designs that can be proposal to the company to increase HDI score. The improvement design can be seen in the table below:

Table 9: Improvement Design Based on Gap and HDI Value of Human Capital

Readiness in Facing Industry 4.0

Aspect	Current condition	Expected	Gap	HD I	Category	Improvement Design
Knowledge	4.054	4.94	0.8 86	0.91 61	Not ready	<ul style="list-style-type: none"> - Increasing digital literation by engage employees into some broadcasts knowledge series related to industry 4.0 knowledges. - Giving an extra point to the employees that has a high willing to learn new technologies by giving them more score in the performance evaluations. - Conduct webinar inside company and invite people that mastery in technology industry 4.0

Table 10: Improvement Design Based on GAP and HDI Value of Human Capital

Readiness in implementing SIERA

Aspect	Current condition	Expected	GAP	HDI	Category	Improvement Design
Knowledge	3.788	4.907	1.1 19	0	Optimal	Knowledge aspect for implementing SIERA already said as optimal. But the company may also continue the iteration of SIERA to increase engagement to the tool. This can be done by periodically spread broadcast via email, or Microsoft Teams, regarding SIERA functions, SIERA update, and benefit in using SIERA.

Aspect	Current condition	Expected	GAP	HDI	Category	Improvement Design
						Hard Skill is an important point in the digital implementation. Company should conduct upskilling and training to the SIERA users about using SIERA. The SIERA developer may also clean some bug that maybe still exist on SIERA. Training for trainers should also be conducted to the employees, since they will be SSF ambassadors to use SIERA and spread the SIERA implementation to the SSF stakeholders.
	Hard Skill	3.221	4.942	1.7 21	1	Not ready
	Soft Skill	3.571	4.955	1.3 84	0.44 02	Ready
						Keep doing the sharing knowledge, via PT Perminyakan Online Learning & Sharing, and also can be via KOMET website (knowledge management system that already owned by PT Perminyakan).

Aspect	Current condition	Expected	Gap	HDI	Category	Improvement Design	Digital Business Agility Solutions	Focus Area	Current Situation	Opportunities for Enablement	Digital Enablers
Attitude	3.189	4.888	1.699	0.9635	Not ready	Increasing engagement SIERA usage to the employees. This can be done with some improvement, conduct quiz to the employee and give some prizes to the employee that can answer SIERA challenges (via Quiz), reviving SIERA usage by reminder by Microsoft teams and pop up notification in the employee's desktop.	Hyperawareness	Situational awareness	Business environment	Increasing user engagement of artificial intelligence-based technology such as SIERA,	Knowledge Sharing and Socialization, technology development.

2. Digital Business Agility Solutions

Writer also describes following digital business agility proposal in order to increase the Human Development Index related to the Human Capital Readiness in facing industry 4.0, for Shared Services Finance function. Hereby the analysis using the digital business agility method:

Table 11: Digital Business Agility Solutions

	Digital Business Agility Solutions	Focus Area	Current Situation	Opportunities for Enablement	Digital Enablers
	Behavioral Awareness	Employees	Employees already have sufficient level of awareness in facing industry 4.0 especially in hard skill aspect, since the technology are being used daily such as MySAP, P-	Company may increase awareness for other technology (industry 4.0) to the employees that employees aren't familiar enough such as big data analytics and artificial intelligence.	E-training platform, Knowledge Sharing, other technology training, and challenges.

	Inclusive decision making	Inclusive environment	There is still silo mentality can be seen in the SSF body. Sometimes employees in the SSF are still not in touch each other in solving some problems addressed by customers.	Develop integrated decision-making platform which is broader than FAQ (Frequent Asked Questions). This platform can be used by employees, and also customer and can be integrated with SIERA, so that it will give not only employee knowledges, but also customers outside SSF.	Integrated Informed Decision-Making Platform		Fast Executions	Dynamic resources	Agile Talent	Some of SSF employees come from millennials generations. But since the rapid, high volume and repetitive job that exist in the organizations, the talent pools are needed to be developed.	involved talent management function to give challenge and targeting some talent pool inside SSF, to develop and sharing knowledge regarding industry 4.0 to the employees, also involved them in some training and in some technology development.	Talent Management & IT Directorate
	Augmented Decision Making	Automated decision maker tools	SIERA is one of the tools, but the basis is still only FAQ.	Enriched SIERA knowledges and train the machine (since SIERA also consider as machine learning) so that the communications via SIERA can be solutions to many disputes and can lead customers also employees to decision made.	SIERA development phase 2			Dynamic processes	Agile and rapid enablement	There is change management function in the Shared Service Center, but maybe can be occupy with the strategic plan regarding digital transform	Role of Research and development team, Digital Transformation Champion	

V. CONCLUSION

Hendarman (2021) also do the research using competencies aspect in Telecommunication, Banking, and Manufacture industry in Indonesia. The research results shows that : Knowledge (K) early stage ready; Hard Skill (HS) not ready; Soft Skill (SS) optimum; Attitude (A) ready. And for this research, from the result of the questionnaire, it is known that there are two aspects of Human Development Index that capture Human Capital Readiness of SSF in facing industry 4.0 era that show not optimum enough, they are Knowledge and Soft Skill. This result also being discussed in the interview sections with some employees and management team in SSF body. Interview was held in form semi-structured interview. The result may show not ready, perhaps affected by many factors. For the knowledge aspects, it is being discussed that there are some factors that affects the situations:

- o The tools being utilize in the SSF are not so many in varieties. Current tools being used are related to MySAP, mySSC, RPA, SIERA, etc.
- o Employees knowledges are limited to the tools that they use every day. We know that SSF job description are very high volume and repetitive, writer can conclude that they don't have spare time to gain own knowledge (outside the daily job)

Other aspects that shows not ready result is Soft Skill aspects. Soft Skill will bring relations to individual adaptive ability to new technologies, and this thing become company strength to endure and sustain from disruption threat as consequences of industry 4.0 digital era (Hendarman, Primatasya, Sufiadi, & Sonia, 2021)

Other questionnaire was conducted and asked about Human Development Index in implementing SIERA – an Artificial Intelligence based technology owned by Shared Services Finance. The result was shows there are two aspects of HDI that got score as "not ready", which are Hard Skill and Attitude aspects. There are some causes that writes gets from the interview section:

- o The usage level of SIERA still low. This can be seen from internal data that SIERA engagement are still low. Customers, Suppliers, even employees were still in their "comfort zone", being served with conventional method: phone, chat, and ticketing from MySSC websites. As the interview result, the SIERA was being created also to educate the users, so that they can do by themselves by asking to SIERA. But it is shown that they are still prefer with conventional method, since the channel are still being open. But the traffic was high enough. This is not help reducing with the customer service load, and

the stakeholders will still need to have queue, even just for asking simple question.

- o SIERA also a new player in the company. Not every employees are using this applications. Unfortunately, Shared Service Finance's employee as well. Since the are rarely using the app, the engagement wasn't high. Socialization and re-upskilling can be done to increase the Hard Skill of HDI aspects for SIERA implementation.

Writer propose seven programs, three for the Human Capital Readiness in industry 4.0, consist of Digital Literation, Digital Leadership, Upskilling and Reskilling, and the last Culture Development. Action in implementing Digital Literation, the company may conduct several broadcasts of technology series to the employees through emails, Microsoft team's media, and KOMET (Knowledge Management Portal owned by PT Perminyakan). And other activity that company may do is conduct webinar inside the company and inviting expert people in technology. These actions expected to increasing knowledge aspect from the Human Development Index assessment and increase employee's personal digital literation. For Digital Leadership, A digital leader should take further steps and has wider view and bring together people he leads to cross the borders and using information technologies and communications to reach organization goals (Cahyarini, 2021) (Klein, 2020) describe characteristics needed as digital leaders:

1. Characteristics-Digital Business. A digital leader should have innovative visionary. Another important characteristic is networking intelligence, that they must capable to coordinate between knowledge, skill, and resources. Digital leaders also have a role as digital talent scout. Other characteristics is they must have complexity mastery and business intelligence to build new business model.
2. Characteristics-Social Attitude. A digital leader has a role as motivating coach and role model to the team. They must be open and transparent to the team, also conduct democratize delegative, designing the organization hierarchy and bureaucracy in minimalist form and focus to the team progress and development.
3. Characteristics-General Mindset. A digital leader should be agile and easy to adapt with the new business model and capable to create transformation strategies. A digital leader also should capable to learn from the errors, knowledge-oriented person and life-long learner.

Upskilling, reskilling, job rotation and experiential learning can be held for all employee's layer in SSF, from assistant until the leaders. Culture Development, can be realized by increasing innovation environment, conduct more

sharing knowledge and growing digital mindset for the employees. Growing digital mindset can be done through self-regulation, self-motivation and self-leadership.

Hendarman (2021) describe that self-regulation is a task that individuals must complete to benefit from new technology and have confidence that technology can be learned in a disciplined and consistent manner. Furthermore, self-motivation is a method of developing self-confidence through the use of new technology, allowing for greater innovation, exploration, and risk-taking. Furthermore, self-leadership focuses on the capabilities of developing independent digital thinking, optimism, and vision in order to become a digital leader in one's own right (Harjanto, 2021)

Other three proposed program are dedicated to SIERA implementation, consist of upskilling, solve application issue and update, and aggressive branding to increase engagement. For upskilling program, company may conduct upskilling event for the users of SIERA, and training for trainers for the SSF employees since they are expected to be brand ambassador of SIERA itself. Solve the SIERA issue may also reduce bug in the application and increase the level of comfort for the users in using SIERA. Bringing up new feature also becoming a propose program, this also will increase user's attentions regarding SIERA presence. And regarding the aggressive branding expected to increase the digital awareness of SIERA.

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Paper 81

Identifying the Causes of Team Effectiveness Problem in
a New Venture Team. Case Study: Agri-Cultured

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Abstract - Entrepreneurship activities around the world are growing. Entrepreneurs carry their entrepreneurial activities by creating a new venture called startup. This new venture called startup is by no means an individual sport. Usually the founder gather a group of individual when founding a startup. Therefore, team effectiveness is an important aspect in the entrepreneurial process of creating a successful startup itself. In this study, the author wants to explore the causes of team effectiveness problems in the startup called 'Agri-Cultured'. Agri-Cultured is a startup founded by four entrepreneurship students from ITB. The CEO of Agri-Cultured states that the idea of the project itself has a lot of potential, but the team is not good enough to be able to maximize the potential that the project has. The project will use the Team Effectiveness Questionnaire (TEQ), which has eight dimensions of team effectiveness. These dimensions are interconnected and will directly impact the New Venture Team's effectiveness. In doing the research, the author starts by conducting a preliminary questionnaire using the TEQ, which will be filled by the members of Agri-Cultured. Based on analyzing the result from the TEQ, the author will conduct an in-depth interview that will be analyzed using qualitative descriptive method.

Keywords – Team Effectiveness, Team Effectiveness Problem, New Venture Team

I. INTRODUCTION

A. Background

Entrepreneurs are expected to contribute to economic development (Audrech, 2003). Entrepreneurs that are able to generate economic development, however, are those that are able to convert their startup into an established firms (Calvino, Criscuolo, Menon, 2015). What became the problem is the low survival rate of startups (Pena, 2002). In the Startup Genome 2019 report, they found that 9 out of 10 startups fail. Furthermore, in 2015 Forbes Magazine wrote that in the US "90% of startups fail in the first 5 years". This is due to the fact that in their lifecycle, startups must face many challenges before they could be successful.

There are several challenges that might occur during the startup lifecycle. Financial difficulties, such as the inability to get external funding put financial limits on

businesses, limiting them from operating efficiently or, worse, hindering innovation, which is a vital component of entrepreneurship (Colombo & Piva, 2008). There's also Human Resource challenges, which is crucial because ineffectiveness in a team, whether it's because the limitation of the founding team capabilities in the field or bad team processes, increase the failure rate due to human resource management issues (Salamzadeh, 2015; Salamzadeh, 2014).

In a study conducted by Cantamessa, Gatteschi, Perboli, & Rosano (2018), they found that the fifth highest factor that leads to the failure of a startup is Bad Organization. They defined Bad Organization as "A startup is usually a chaotic environment. Thus, rules, roles, and tasks have to be well organized and assigned to each member of the team for efficiently managing all the activities". Moreover, one of the aspects related to the organization issue is the location of the team. The report from Failory also have similar findings where "Team Problems" are the third biggest factor in startup failures (Failory, 2022). This shows how the "team / organization" factor is a crucial factor for the startup team to be able to succeed.

Agri-Cultured is a startup founded by four entrepreneurship students based in Bandung since 2021. When founding the company, the founding team had a vision to advance the agricultural sector in Indonesia, since Indonesia is an agrarian country. For their first product, they try to tackle the problem of food waste and loss by creating a food technology product called edible coating. This product is able to extend the freshness of fruit and vegetables so that less food is wasted. The company recently lost their key partner to make them able to do their operational processes. It's one of the factors that demotivates the team and makes the startup progress stagnant.

The founding team of a startup plays a crucial role in the firm's growth and because of that it becomes a problem when the founding team is ineffective. This is due to the important role the founders have in setting the initial vision and shaping the growth of their newly built venture (Choi, J., Goldschlag, N., Haltiwanger, J. C., & Kim, J. D., 2021). Therefore, it is important to ensure that the ones behind the wheel know what they are doing and get rid of the obstacles in the team processes to maximize the potential of the firm.

In an interview, the CEO / Project Manager of the startup Agri-Cultured stated that the progress of the project remains stagnant. He still thinks that this project has a lot of potential to succeed but he believes the main problem with the project is the team involved with the project. The project manager stated that his team is "currently ineffective". The factor that he thinks contributed to this phenomenon is the lack of moral support and commitment in his team that makes him also unmotivated for the project. He feels like he's the only one that truly believes and committed to this project. Eventhough he already has an assumption regarding the causes of the problem, he needs a theoretical framework so that can validate his assumptions and he does not overlook what might be a crucial component causing the problem. The project Manager wanted to identify the factors contributing to his team's ineffectiveness and explore the reasons behind it.

B. Research Questions

- RQ1 : What are the team effectiveness dimensions that becomes a problem in Agri-Cultured?
- RQ2 : Why are those dimensions still not effective?

II. METHODOLOGY

A. Conduct the Preliminary Questionnaire

This study's sample consists of the presently active members of Agri-founding Cultured's team. Sample comprehension of the issue should be the basis for their selection (Freedman, et al. 2007) Since they are the ones who best understand the condition of the team, the issue, and also as the subject of this study, it makes sense to gather data from their point of view to get the best qualitative answer for the research question. It is referred to as "purposeful sampling," which is a common qualitative research sampling technique (Cresswell, 2007)

This research uses explanatory case study qualitative method with a pre luminary questionnaire. The result of the questionnaire will be analyzed with descriptive analysis and the result will be the basis of the semi-structured interview data collecting method.

The preliminary questionnaire is conducted with google form. There are several reason for implementing this data collecting strategy. First, the Team Effectiveness Questionnaire is the type of questionnaire that's answered with a linear scale, google form are capable for inputting this kind of data. Second, the result from the google form could be directly exported to sheets, which makes the data collecting process more efficient. Lastly, the respondent have more time flexibility in answering the questionnaire. Due to reasons mentioned above, the

google form data collecting strategy is suitable for this preliminary questionnaire.

Before examining the data, it is necessary to identify what constitutes a high and low TEQ score. The TEQ consists of 56 items over 8 distinct categories, with respondent answers ranging from one to five points: (1) "Strongly disagree," (2) "Disagree," (3) "Neutral," (4) "Agree," and (5) "Strongly agree." The statements in the questionnaire suggest good qualities in a team, hence the higher the score for team effectiveness, the more the respondent's agreement with the statements. If the responder replies "strongly agree" to each question, the overall TEQ score would be 40 points and the team effectiveness score may be deemed "very high." If the responder answered "agree" to each item on the questionnaire, the total TEQ score would be 32, and it might be stated that the team effectiveness score is "fairly high." If the responder answered each item of the questionnaire with "Neutral," the overall TEQ score would be 24 points, and it might be determined that the TEQ score is "Adequate." If the respondent answered "Disagree" to each item on the questionnaire, the TEQ score would be 16 points and the team effectiveness score would be deemed "Fairly poor." Lastly, if the responder answered each issue on the questionnaire with "Strongly disagree," the score would be 8, and it might be argued that the score for team effectiveness is "extremely poor" (Law, 2020)

B. Conduct a Descriptive Statistical Analysis of the Outcome

Descriptive Statistical Analysis is conducted for the preliminary questionnaire. The scope of the score is 32 (40 - 8) there are five category in measuring team effectiveness (very strong, fairly strong, neutral, fairly weak, very weak) To know the exact number of range for each category, we need to divide the range from the highest score to the lowest score (32) with the number of categories in measuring team effectiveness (5) therefore the range for each category is 6.4. The result for the measurement table for the total TEQ score is proposed below:

Table 1 - Categorizing Score for Total TEQ Score

Score Range	Category
33.6 to 40	Very high
27.2 to 33.6	Fairly high
20.8 to 27.2	Adequate
14.4 to 20.8	Fairly Poor
8 to 14.4	Very Poor

There's some differences when measuring the team effectiveness dimensions individually. Each dimension have seven questions which means the minimum score for each dimensions is 7 and the maximum score is 35. With the same categorizing method above, the measurement table for the individual dimensions effectiveness score is proposed below:

Table 2 - TYPE SIZES FOR CAMERA-READY PAPERS

Score Range	Category
29,4 to 35	Very High
23.8 to 29.4	Fairly high
18.2 to 23.8	Adequate
12.6 to 18.2	Fairly Poor
7 to 12.6	Very Poor

C. Data Collecting Using Semi-Structured Interview

The preliminary questionnaire gives an insight about the POV of each member of the Agri-Cultured team. This interview questions aims to dig deeper into the causes of the lack of effectiveness in each dimensions, which will lead to identifying the causes of team effectiveness problem in Agri-Cultured. To achieve that, the questions listed below make each member of Agri-Cultured to recognize the list of dimensions that they personally or collectively think is below adequate and ask them what may be the reasoning behind it. It adheres to the recommendation of Vagle (2013) to make no inferences about the participants' actual intent, instead using follow-up commands such as "please elaborate more".

In this research, in-depth interviews serve to validate the preliminary questionnaire responses. In addition, the questionnaire is a one-sided procedure that can only provide findings based on a Likert scale, which makes an interview a convenient way to learn more about the respondent's viewpoint. This idea is supported by Showkat et al. (2017), who state that an interview broadens and enhances researchers' knowledge of a certain issue. For instance, interviews allow researchers to ask follow-up questions about unanticipated topics that arise during the talk. In this instance, the interview will occur through an internet video conference and will last roughly 30 minutes.

D. Data Analysis

In this study, the qualitative data could be considered as naturalistic and based on the perception of the participants. This study aims to get comprehensive information regarding the causes of team effectiveness problem in Agri-Cultured. It best analyzed by qualitative descriptive method that investigates a phenomenon to

extract holistic information from the data (Nassaji, 2015). It will be used as an instrument to dig deeper into the causes of the team effectiveness dimensions problem that's already identified in the preliminary TEQ. The findings from the analysis step will be considered the causes of team effectiveness problem in Agri-Cultured.

III. Results

A. Preliminary Questionnaire

Table 3 - Overall Team Effectiveness Score for Each Member

Dimension	Respondent 1	Respondent 2	Respondent 3
Purpose and Goals	3.29	2.86	2.00
Roles	3.57	3.71	3.29
Team Processes	2.29	3.14	2.86
Team Relationships	4.57	3.57	3.00
Intergroup Relations	2.29	3.14	3.43
Problem Solving	3.57	3.14	2.86
Passion & Commitment	3.29	2.57	1.57
Skills & Learning	2.29	2.43	2.14
Total	25.14	24.57	21.14
Category	Adequate	Adequate	Adequate

Each member scores could be categorized as "Adequate" which is not good enough to be categorized as high but also not bad enough to be categorized as poor. It could be concluded from the result of the overall team effectiveness score for each members shows that there's no significant difference between what each team members perspective about the team.

Table 4 - Categorizing Overall Score for Each Dimensions

Dimension	Average Score	Category
Purpose and Goals	19.00	Adequate
Roles	24.67	Fairly High
Team Processes	19.33	Adequate
Team Relationships	26.00	Fairly High
Intergroup Relations	20.67	Adequate
Problem Solving	22.33	Adequate
Passion & Commitment	17.33	Fairly Poor
Skills & Learning	16.00	Fairly Poor

Table 4 shows the average score from each team member to each variable. It can be seen that there are two dimensions that's considered "Fairly high" (Roles, Team Relationship), four dimensions that's considered "Adequate" (Purpose and Goals, Team Processes, Intergroup relations, and Problem Solving) and two dimensions that considered "Fairly poor" (Passion & Commitment, Skills & learning).

Table 5 - Categorizing Individual Score for Each Dimension

Dimension	Respondent 1	Respondent 2	Respondent 3
Purpose and Goals	Adequate	Adequate	Fairly Poor
Roles	Adequate	Fairly High	Adequate
Team Processes	Fairly Poor	Adequate	Adequate
Team Relationships	Very High	Fairly High	Adequate
Intergroup Relations	Fairly Poor	Adequate	Fairly High
Problem Solving	Fairly High	Adequate	Adequate
Passion & Commitment	Adequate	Fairly Poor	Very poor
Skills & Learning	Fairly Poor	Fairly Poor	Fairly Poor

Table 5 shows the categorized individual score for each dimensions. The different answer among team members will be more visible in this table. This table shows that all of Agri-Cultured team members agreed that the skills and learning aspect of their team is "Fairly poor". From respondent three perspective, it can be seen that he thinks the "passion & commitment" dimensions in the team is "Very Poor" which is the only item that's categorized as "Very Poor" in this table.

B. Data Analysis: Semi-Structured Interview

Table 6 - The Cause of Agri-Cultured's Problematic Dimensions

Dimension	Identified Problem	Problem Cause	Core Cause
Purpose and Goals	Lack of Purposeful goals Fulfilling Academic needs		
Passion and Commitment	Feeling fed up Low priority of Agri-Cultured Unwillingness to continue Agri-Cultured Personal Interest	Academic Formality	Academic Formality
Team Processes	Lack of Initiative Lack of Coordination	Low Priority of Agri-Cultured	
Skills & Learning	Lack of Skill and Knowledge Academic Curriculum	Curriculum-Student Fit	
Roles	Overlapping Job Delegations		Curriculum-Student Fit
Problem Solving	Hopelessness Bottleneck in Agri-Cultured Business Process	Lack of Skill and Knowledge	
	Communication Problem	Online Communication Problem	Online Communication

Team Relationship	Covid-19 Pandemic	Problem
	Team Casual Relationship	

This table displays the result of the process of analyzing the data. It's responsible in transforming all of the incidents into three comprehensive factors, as the main cause of team effectiveness problem in Agri-Cultured. Those three main cause are: Academic Formality, Curriculum-Student Fit, and Online Communication Problem.

1. Purpose and Goals

In the Purpose and Goals dimension problem, the incidents from the interview indicates that there's a lack of purposeful goals in the Agri-Cultured team. The respondent mentioned that they just do what they're told to, so there is no process of setting their own goals which is an essential part of this dimension. Later, it is also identified that the sole purpose of Agri-Cultured is to fulfill academic needs. It gives more context to the reason why the Agri-Cultured team just to what they're told. These two factors could be summarized as the Agri-Cultured team doing the business is just an act of formality for their academic.

"So it's really just because of academic needs, I'm sure of that. When there are academic needs, we want to do research, we want to have business meetings, but when there are no academic ties, I'm sure Agri-Cultured won't run."

One of the respondent even ensures that all of the business activities in Agri-Cultured will not run if it not for the sake of the academic. It further strengthens the point of the lack of strong purpose of the existence of Agri-Cultured, that Agri-Cultured is nothing more than just to fulfill academic requirements.

2. Team Relationship

In the Team Relationship dimension, there are three factors identified as the causes of the problem. The first one is communication problems, which is identified by the respondent directly mentioning the word communication when interviewing them. The second one, is the covid-19 pandemic, which is not mentioned directly by 66% of the respondent and mentioned directly by the rest of the respondent. The third one is the team casual relationship problem, which is categorized as such with no direct mentions of the word but from the incidents mentioned, it could be categorized as such.

"The negative thing about Agri-Cultured, according to me, is lack of communication. but of course, i understand it's

really difficult because of the covid situation, I also felt that in my previous team."

The correlation of these factors could be seen as an online communication problem. The preoccurance of this problem could be seen in the team casual relationship dynamic, where before Agri-Cultured was formed, the team members doesn't know each other. Then the covid-19 pandemic happened, making the Agri-Cultured team unable to communicate intensely with one another. This in the end, causes the lack of communication between the team members of Agri-Cultured, which is why the factor that's identified causing it is 'Online Communication'.

3. Passion and Commitment

In the Passion & Commitment Dimension, there are four factors identified that as the causes of the problem in the dimension. There are Low Priority of Agri-Cultured, Unwillingness to Continue Agri-Cultured, Feeling fed up, and Personal Interest. What is considered to be the core of these problem is the same as the Purpose and Goals, that is 'Academic Formality'. The problem starts from lack of personal interest to the business which leads to categorizing Agri-Cultured as a low priority and feeling fed up of the business. In the end, it what leads to the team members unwillingness to continue Agri-Cultured where there's no more academic requirements.

4. Skills and Learning

There are two factors that is identified as a problem in the Skills & Learning dimensions. These two factors could be categorized as high determining factors due to 100% of the respondent indicating the incident. The first factor identified is 'Academic Curriculum' and the second factor is 'Lack of Skills and Knowledge'. The three incidents identified as the 'Academic Curriculum' factor shows the problem despite having the same point, it consist of three different lens. Respondent 1 indicates this problem trough mentioning the lack of direction of the campus that makes the team clueless. Respondent 2 indicates this problem through mentioning the loophole in the curriculum that he can exploit, and Respondent 3 indicates this problem by adressing the requirement that the curriculum demands that he thinks is unfit for the students.

In the 'Lack of Skill and Knowledge' factor, the respondent showed a quite different aspect of what kind of skills and knowledge lacking in Agri-Cultured. Respondent 1 mentions that the team is lacking in the development process of the product, Respondent 2 mentions that the team is lacking the knowledge in agriculture / foodtech industry in general, and Respondent 3 states that the team is lacking in the technological aspect. Despite of the different wording, these three statements indicates

similar point.

"It's the curriculum that demands creating a tech-based business, which also makes us dumbfounded. Just imagine, we're a social science high school graduate who don't have a faintest clue about tech are suddenly told to start a tech-based business."

The correlation between the 'Academic Curriculum' factor and the 'Lack of skills and knowledge' factor is put best by the statement above. The academic curriculum that demands the students who have no basic knowledge of technology to create tech-based business is just going to end up the students creating a business they lack skills and knowledge about. This correlation shows that there's a problem in the 'Curriculum-Student fit' factor.

5. Team Processes

In the team process dimension the causes of the problem identified is the 'lack of coordination' and 'the lack of initiative'. The 'Lack of coordination' factor is referring to the time period of which the respondent feels this problem. It give context to the internal condition of the Agri-Cultured team when the team is split up. While 'the lack of initiative' itself is reflected by the two main divisions that Agri-Cultured has. Ideally, the team has to hold regular meetings and have their report on what they have been doing. However, there's no initiative taken by the members of the Agri-Cultured team to do this.

'Academic Formality' is identified as the core factor that causes these two other factors happened. The incident in the 'Lack of Coordination' and the 'Lack of Initiative' factor serves as another proof that the Agri-Cultured team not considers Agri-Cultured as their main priority. It could be said that to summarize these two factors we could use the 'Low priority of Agri-Cultured' that's already mentioned earlier in the Passion & Commitment dimension. However, we already know what causes the 'Low priority of Agri-Cultured' factor. Therefore, it can be concludent that the cause of the 'lack of coordination' and 'lack of initiative' is academic formality.

6. Roles

The roles dimension problem in Agri-Cultured is caused by the overlapping job delegations. "Doing the same thing" in interpreted as an overlap in delegating jobs between team members. The cause of this problem is no other than the homogenic team member expertise in the Agri-Cultured team. The Agri-Cultured team members consist of four people studying the same major. It's no surprise that there'a an overlapping jobs between team members in the team. 'Overlapping job delegations' as a problem identified in the Agri-Cultured team is ironic because in

other hand the problem identified in the Skills & Learning Dimension is 'Lack of skill and Knowledge' in the team. It serve once again as a proof of the 'Curriculum-Student Fit' as a the core of this problem.

7. Problem Solving

From the statements above, the main challenge that is faced by the Agri-Cultured team is to develop the product. First, they struggling to find a hacker, then they try to collaborate with other company that also develop edible coating (BACOAT), lastly they try to develop the product themselves. Despite these efforts, there's always something that act as a bottleneck to the process. This leads to the team feeling pessimistic about their possibility of executing this business and in the end, they feel hopeless. This in the end, crushes their sprit making them unable to continue striving and searching other ways to overcome the challenges.

"We feel bored, fed up, and hopeless because we are faced with a challenge that we are really have no idea how to solve it"

This is the key incident that indicates the cause of the group's inability to overcome the challenges in their business. They having no idea of the way solving that indicates that there is a lack of competence in the Agri-Cultured team, which is why the core cause of the Problem Solving Dimension problem in Agri-Cultured is 'Lack of Skill and Knowledge'. This dimension is already identified earlier in the Skills & Learning dimension and is considered to be caused by 'Curriculum-Student Fit'. Therefore, it could also imply that the core factor of the problem in this dimension is 'Curriculum-Student' Fit.

Fig. 1. Magnetization as a function of applied field.

Note how the caption is centered in the column.

IV. DISCUSSION

The data collecting Process starts with conducting a preliminary questionnaire to the respondents. The result from the questionnaire serves as the basis for further exploration and will be validated on the semi-structured interview. The two problematic dimension that the preliminary questionnaire identifies are validated in the interview data collecting process. However, there are some differences in comparing the findings of the preliminary questionnaire and the result of the interview. Most notably, is the 'Team Relationship' dimension. Whereas the from the preliminary questionnaire the 'Team Relationship' dimension score is considered fairly high. However, many incidents were identified as a problem in the 'Team Relationship' dimension. Moreover, the core problem of

this dimension (online communication problem) is not caused by a problem in another dimension. It solidifies the essence of the interview process in identifying the problem that the questionnaire unable to identify.

The readers of the research might have noticed in this point that there are same statements throughout the data analysis process that's identified as incidents for multiple factors.

"I feel like our curriculum didn't give us really meaningful directions. we're clueless, the theory from the campus doesn't help much either, I think it is the reason why as time progressed, our enthusiasm became weaker"

This statement for example, is mentioned in two different factors in different dimensions. It is mentioned in the 'Feeling Fed Up' factor in the 'Passion and Commitment' dimension as well as in the 'Academic Curriculum' in the 'Skills and Learning' dimension. From the respondent perspective it could be concluded that the problem of 'Academic Curriculum' is the cause of the problem in the 'Feeling fed up' factor.

"I think my passion is very low in this project. First, I have no knowledge about the agriculture / foodtech industry. Not just the knowledge, I even don't have a slightest interest in this industry. Well I could understand why though, because it's for the sake of my academics, and we have little time to think, and i just go with the flow."

Another example is this statement by respondent 3 which connects 'personal interest', 'lack of skills and knowledge', and 'academic formality' factor. Which in this statement he indicates that 'academic formality' is what leads to the problem of 'personal interest' and 'lack of skills and knowledge' factor.

The most prominent example is the relationship between Team Process Dimension and Passion & Commitment Dimension. The core cause of the problem in Team Process Dimension is 'Low Priority of Agri-Cultured', which is already identified earlier in the Passion & Commitment dimension. In the Passion & Commitment Dimension it is identified that what causes 'Low priority of Agri-Cultured' is 'Academic formality'. From this findings, it could be concluded that what causes the problem in the Team Process Dimension is a problem in the Passion and Commitment dimension.

This shows as a proof that the dimensions from the TEQ is interconnected to one another, which one thing that is a problem in one dimension could lead to a problem in other dimension. It's fascinating in finding how these dimensions correlates and impacts each other. However, the author thinks that this is not the end of it. Future research

needs to explore further the relationship between each of these dimensions, how they impact each other, and how significant it is they impact one another and team effectiveness.

In Agri-Cultured's case, the team effectiveness dimension Purpose & Goals, Passion & Commitment, and Team Processes is identified as having the same root cause. However, this "root cause" seems to have a deeper root beneath it.

"Oh absolutely, if the others we're committed to tackle take this business seriously, then I will"

"At first we were committed to the business, but as time goes by our spirit declined, I think we were just fed up."

Looking back at These statement from the respondens shows that the Agri-Cultured team didn't initially want to treat the business just for the sake of fulfilling academic requirements. In fact, they want to take this business seriously, but as time goes by there are factors that continuously makes their spirit declined and it makes them unable to do so.

"I feel like our curriculum didn't give us really meaningful directions. we're clueless, the theory from the campus doesn't help much either, I think it is the reason why as time progressed, our enthusiasm became weaker"

This statement from respondent one indicates that there is a relationship between the 'Curriculum-Student Fit' and 'Academic Formality'. It indentifies the casualty effect between these two factors, more spesifically it indicates that Curriculum-Student Fit' is the cause of the 'Academic Formality' factor.

The findings above further signifies the significance of 'Curriculum-Student Fit' as a core factor that causes team effectiveness problem in Agri-Cultured. Since it now not only affects three dimensions of team effectiveness as mentioned above, It now affects six from seven problematic dimensions in Agri-Cultured. This issue should be recognized by the institutions who has Entrepreneurship Program especially Entrepreneurship Program in SBM ITB (the institution Agri-Cultured based on) and furtheraction is needed to address the problem.

To be fair in discussing this issue, the blame cannot be all directed to the institution involved. We also have to recognise other factor that might cause this problem that's outside of the control of the institution itself. To be exact, the factor that is outside of the control of the institution that the author's talking about is the Covid-19 pandemic.

The author have to clarify that there's limited data that the author collects that could act as a concrete proof of the correlation. However, it is safe to assume that the Covid-19 pandemic forces the entrepreneurship program in SBM ITB to adjust many aspect of the curriculum to the pandemic situation, making it very hard for the program to maximize the curriculum they had already planned out. Moreover, Agri-Cultured is the first generation in the Entrepreneurship Program in ITB to operate in a pandemic situation. There's have to be an adjustment made that somehow reduces the essence of the curriculum itself. Therefore, it safe to conclude that the covid-19 pandemic causes the problem of 'Curriculum-Academic Fit' in Agri-Cultured.

On how this 'Online Communication' factor becomes a problem and how the covid-19 pandemic causes it is already mentioned in the data analysis section above. The name of the factor itself 'Online Communication' is quite self explanatory tp indirectly tell the readers of what is the core of the problem. It could be argued that the covid-19 pandemic is not the root cause of the problem in the Team Relationship dimension. It could be argued that the 'Team Casual Relationship' factor is the core problem because if the team relationship is already developed before the pandemic occurs, the covid-19 pandemic might not be a problem. However, it is also applies vice versa. It could also be argued that if the covid-19 pandemic never happened the team relationship could develop better. Therefore, it could be concluded that the covid-19 pandemic is the cause of the problem of the 'Online Communication' factor in Agri-Cultured.

TABLE 6 - The Cause of Agri-Cultured's Problematic Dimensions

Dimension	Identified Problem	Problem Cause	Core Cause
Purpose and Goals	Academic Formality	Academic Formality	
Passion and Commitment			
Team Processes	Low Priority of Agri-Cultured		Covid-19 Pandemic
Skills & Learning	Curriculum-Student Fit		
Roles		Curriculum-Student Fit	
Problem Solving	Lack of Skill and Knowledge		
Team Relationship	Online Communication Problem	Online Communication Problem	

As if right now in 2022, we could see countless of research on the effects of the covid-19 pandemic on many aspects of our lives. This research didn't initially intend to be one of those research, but apparently right now, it is. The Covid-19 Pandemic is identified as a core factor that affects 'Online communication Problem' and 'Student-curriculum Fit' in Agri-Cultured, even though there's no telling on how significant the covid-19 Pandemic affects those factors.

V. CONCLUSION

RQ1 : What are the team effectiveness dimensions that becomes a problem in Agri-Cultured?

Based on the preliminary questionnaire, it is identified that there are two dimensions in Agri-Cultured that's considered problematic. The problematic dimensions identified are Passion & Commitment and Skills & Learning because they're the two dimensions that the score in the survey could be categorized as "Fairly poor". However, when exploring the topic further in the semi-structured interview data collecting process, there are seven dimensions that is identified as a problem in the Agri-Cultured company: Purpose & Goals, Team Relationship, Passion & Commitment, Skills & Learning, Team Processes, Roles, and Problem Solving. However the quantity of the identified problem in each dimension is varied from one another. Amongst this seven problematic dimensions, based on the quantity of the incidents identified in each dimensions, Passion & Commitment dimension is considered as the most problematic team effectiveness dimension in Agri-Cultured, with eleven different incidents identified.

RQ2 : Why are those dimensions still not effective?

From the seven problematic dimensions in Agri-Cultured, it is identified that there are three core factors that causes it. From the factor 'Academic Formality' we could conclude that the Agri-Cultured team sole purpose in running the Agri-Cultured business is to fulfill academic needs. From the factor 'Online Communication Problem' we could conclude that the covid-19 pandemic negatively affects the relationship development of the Agri-Cultured team. The factor 'Curriculum-Student Fit' highlights the misfit between the curriculum and the students resulted in the lack of skills and knowledge that the students could've develop when running the business.

In conclusion, Agri-Cultured sole purpose to fulfill academic requirements, inability to develop relationship through online communications, and the unfitness of the curriculum in accommodating the students business is identified as the factors that causes of team effectiveness problem in

Agri-Cultured.

When exploring these factors further, the author finds that the Agri-Cultured team actually wants to take the business seriously but are unable to do so. It is identified that the unfitting curriculum is actually what makes the Agri-Cultured unable to do so. Therefore, it is concluded that the factor 'Academic Formality' is caused by 'Curriculum-Student fit'.

The 'Curriculum-Student fit' factor that's also has been considered as a "core factor" turns out to also have a deeper root. The author thinks that it is unfair to put all the blame on the institution, the author assumes that there's might be another factor causing it to happen. The author thinks that covid-19 pandemic contributes as a factor that causes the 'Curriculum-Student Fit' dimension. In the 'Online Communication' factor, the casualty aspect between this factor and the covid-19 pandemic seems more obvious. Therefore, it could be concluded that covid-19 pandemic is the core factor that is identified as a cause of team effectiveness problem in Agri-Cultured. This conclusion is also supported by (Tadesse, et al, 2020) that further emphasizes the impact of covid-19 pandemic on the education system.

The implications of this research could be seen from three perspective: Agri-Cultured, entrepreneurs, and Entrepreneurship Program (especially in SBM ITB). For Agri-Cultured, now the team get the full picture of the problem and causes of the team effectiveness problem in their company. Now that they are full aware, the next step is to finding a way to solve the problem. Based on the three identified core problems for the Agri-Cultured team, the author would recommend the company to pivot. Agri-Cultured could start by recruiting new members that take the business seriously. Next is to finding an environment where the team members could build an organic relationship while doing the business processes. Lastly, because after graduation there's no other academic curriculum as a limitation of possibilities of the kind of business executed, the Agri-Cultured team could discuss about what kind of business that they have the skills, knowledge and interest of to be executed.

For entrepreneurs, this research could be seen as a reflection for their own company. It also could be used as a guidance or a method if they ever wanted to identify the problem in their own new venture team. It's important to be aware of the dimensions that could potentially be problematic for the team effectiveness and knowing the process of identifying them. This research however, is best used by entrepreneurs who also attending entrepreneurship as a major. There are factors in this research that will not be too relevant for entrepreneurs with no ties to an academic institution.

For Entrepreneurship Program in SBM ITB, there is a need to re-evaluate how the curriculum could fit the students entering the program, designing a curriculum that not act as a limitation for the students potential, rather maximize it. What become the main problem for Entrepreneurship Program in SBM ITB is the requirement to create a tech-based business for the students, which is ambitious and add an unique value for Enrepreneurship program in SBM ITB but also create a major problem that already explained in chapter 5. To mitigate from this problem while also still maintaining they're unique value, Entrepreneurship Program in SBM ITB could conduct their own entrance test (like FSRD ITB) that measures the student candidate interest /expertise in tech-business as an important factor to put into consideration. This allows Entrepreneurship Program in SBM ITB to maintain their unique value and make it in line with their student aspirations. When the students views their business in the program as a real business practice, not just for fulfilling academic needs, the Entrepreneurship Program in SBM ITB increases it's probability to nurture real entrepreneurs that hopefully able to create real entrepreneurial output.

For researcher, this research could be used as a fondation for exploring this topic on a much deeper level. The author gives several recommendations to future researchers interested in tackling this certain topic. First, the author thinks that further research regarding the 'Academic formality' and 'Curriculum-Student Fit' aspect needs to be explored further. The author thinks these two factors are particularly important for developing entrepreneurship education. Second, the author thinks that there's endless possibilities of future research that could analyze these thirteen factors identified on a deeper level. The interconnectedness between each dimension is the key aspect for this reccomendation. It could explore the relationship and the significance level of these identified factors to one another, to team effectiveness dimensions, to team effectiveness itself, or other factors. Third, future researchers could use much more sample to create a more saturated data that could obtain results with higher level of validity.

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Paper 82

Decision-Making Process in Developing A “Quick Win”
Program to Increase Oil Production in PHE Subholding
Upstream

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ICMEM

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Abstract - Throughout 2021, PT PHE as an Subholding Upstream, faced the issue of unachievable drilling well target with the realization only 88.4% of the YTD RKAP Revisi target, and 84% of the RKAP Revisi target that were successfully onstream. This issue has an impact on the oil production target from August to December 2021 where the total realization of oil production up to Q4 in 2021 was 88.2% of the oil production target.

This study aims to select and determine the decision-making process in order to find a solution to the issue of decreasing oil production volume in the Subholding Upstream, especially in Regional 2 area and determine proposed wells that are easy to execute as the main guide in developing the Quick Win Program in Subholding Upstream.

The results of calculations using the Weight Sum Model method in the form of alternative rankings in the Regional 2 and from the calculation with the DTA method, the Quick Win Program simulation showed an increase in production compared to the original case in forecasted production profile of the RKAP 2023 development wells.

Keywords - Weighted Sum Model, Decision Tree Analysis, Quick Win Program

I. INTRODUCTION

The production of oil and gas fields in Indonesia and especially in Pertamina's work areas has passed the peak period of production and is now entering a phase of natural production decline since the last 10 years. The downward trend in oil and gas lifting is mainly due to the large number of old oil wells, characterized by the beginning of a natural decline in production as can be seen from the increasingly high-water content in the reservoir. With various efforts made by the company, such as exploration activities and intensive new field discovery efforts, replenishment of reserves, optimization of production, reliability of production facilities, efficiency and technological innovation, it is hoped that the decline in production can be restrained.

PT Pertamina continues to strengthen its commitment to achieve the company's vision and mission in the context of transformation into a global company with a target market value of \$100 billion by 2024 while continuing the main agenda of the energy transition going forward.

The transformation within the company itself through the restructuring of Holding and Subholding has been going on since mid-July 2020. Pertamina now has a very strategic role in overseeing five sub-holdings engaged in energy, i.e., Subholding Upstream which is operationally run by PT Pertamina Hulu Energi. PT Pertamina Hulu Energi is assigned to manage the business and operations of upstream business activities within PT Pertamina (Persero) and its subsidiaries and affiliates of PT Pertamina (Persero) within the scope of the Upstream business group, including carrying out upstream business activities regionally by upstream subsidiaries. This research will focus on the Subsurface Development & Reserve Evaluation (SDRE) a strategic organization under the Directorate of Development and Production Subholding Upstream that has a role and responsibility in achieving targets, reliability and sustainability of subsurface development, Enhanced/Improved Oil Recovery (E/IOR) as well as reserve and resource management.

Throughout 2021, 350 wells have been drilled throughout all Regional or 88.4% (-11.6%) of the YTD RKAP Revisi target. From a total of 350 drilling wells, 294 drilling wells or 84% (-16%) of RKAP Revisi target have been successfully onstream. From the achievement of onstream wells, the oil production target for August to December 2021 has not been achieved.

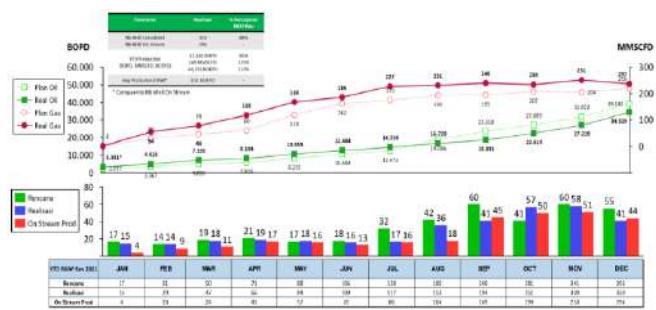


Fig. 1. Production Performance of RK 2021 Development Drilling

The total realization of oil production until Q4 in 2021 was 445.3 MBOEPD or 88.2% (-11.8%) of the oil production target of 504.84 MBOEPD (Figure 1)

II. METHODOLOGY

The conceptual framework is created to describe the main problems that arise in the upstream business processes that must continue to run. The upstream process business also demands the reliability of SDRE in terms of subsurface engineering in carrying out its functions and responsibilities to achieve the production target of development wells in Subholding Upstream. The expected condition is the existence of a Quick Win Program that can increase oil production, through the quality of decision making and project implementation plans that are easy, agile, and reliable (Figure 2).

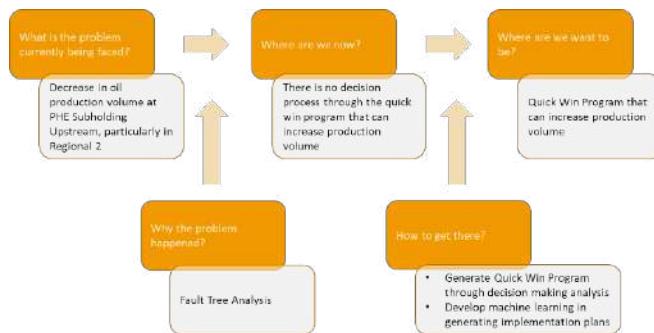


Fig. 2. Conceptual Framework

Several steps are used in answering problems and finding solutions, including:

- Identifying Main Problems and Analyzing Root Causes: Root Cause was analyzed using the FTA (Fault Tree Analysis) method. Fault Tree Analysis is a top-down deductive analysis in which unwanted systems are analyzed using Boolean logic (Martensen, 1987). From the root cause analysis using FTA, the results of the root causes of the main problems in SDRE are as follows: proposed wells that are not economically viable or economically marginal, subsurface issues during and after drilling, and completion problems. Subsurface issues can be broken down into the following: Dynamic Uncertainty, Structural/Static Uncertainty, Facies Heterogeneity & Reservoir Quality and Completion Issues (Figure 3).

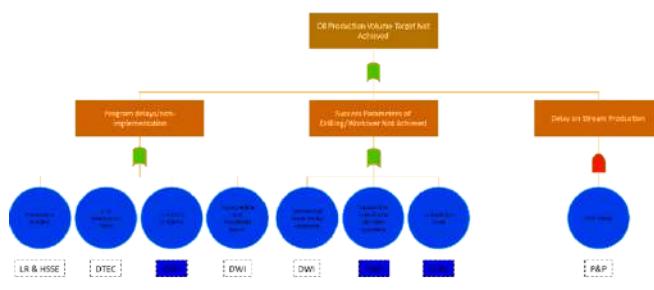


Fig. 3. Fault Tree Analysis of Main Issue

In the FTA tree, the peak events are based on the risk management activities performed by SDRE. Risk management itself is an activity of routine inspection, supervision, and observation as well as determining the status of actual performance compared to the plan that will be produced. Risk management activities themselves have an important role in avoiding or minimizing potential losses, optimizing opportunities and maintaining a conducive environment. The results in the form of the main risks are written in the monitoring report form and reported on a monthly and quarterly basis (Table 1).

Table 1 - EXAMPLE OF TOP RISK DETERMINATION

No. Risk Event	Risk Event Name	Medium Risk	Jumlah Risiko			Threat Index	SIR Incident
			T	p. RMR	IEC (Risk Loss)		
1	Subsurface Development & Resource Evaluation	Vadai Formasi Canggung & Tambang Sander Daya serta tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	4	2	0,00	8,00
2	Subsurface Development & Resource Evaluation	Pelapisan Canggung & Tambang Sander Daya pada tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	3	2	0,00	8,00
3	Subsurface Development & Resource Evaluation	Perbaikan dan peningkatan kualitas data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	3	4	0,00	8,00
4	Subsurface Development & Resource Evaluation	Total kelebihan target produksi teknologi baru pada tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	3	2	0,00	8,00

Qualitative	Jumlah Risiko			Threat Index
No. Risk Event	Risk Event Name	Medium Risk	Risk Impact	SIR Incident
1	Subsurface Development & Resource Evaluation	Vadai Formasi Canggung & Tambang Sander Daya serta tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	8,00
2	Subsurface Development & Resource Evaluation	Pelapisan Canggung & Tambang Sander Daya pada tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	8,00
3	Subsurface Development & Resource Evaluation	Perbaikan dan peningkatan kualitas data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	8,00
4	Subsurface Development & Resource Evaluation	Total kelebihan target produksi teknologi baru pada tambahan data hasil survei dan analisis teknis pada pelapisan canggung & tambang sander daya	0,00	8,00

- Developing Quick Win Program: Quick Win Program procedure consists of selecting a database structure/oil and gas field as an alternative, determining the defined criteria and sub-criteria, determining the weight of the assessment of each criterion and sub-criteria, appointing experts, calculating the final total of the assessment system, grouping oil and gas fields (alternatives) in 5 categories, ordering proposed wells of RKAP 2023 based on the best alternative, data analysis and simulation of quick win programs, and recommended solutions (Figure 4).

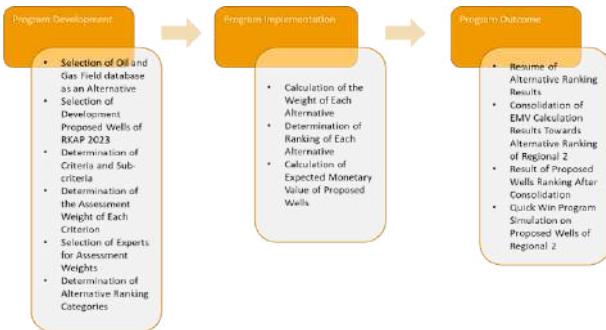


Fig. 4. WSM and DTA Approach in Developing Quick Win Program

In developing Quick Win Program, Weighted Sum Model was chosen because it is the most suitable method among other Multi-Criteria Decision Analysis methods. The consideration is the number of oil and gas fields as alternative that are widely spread in the Regional 2 area with all subsurface data in it. Another consideration that is

no less important is all oil and gas fields must be included in the analysis to ensure that all available alternatives remain objective to be assessed by all experts in the SDRE organization. The expert considered that a priority system was needed in the management pattern of the oil and gas field in order to facilitate the allocation of resources, humans, technology, and other supporting facilities.

The calculation begins with preprocesses the data by determining the criteria and sub-criteria that will be used as a reference in making decisions to achieve the desired goals. The determination of the criteria and sub-criteria agreed upon by the forum covers various subsurface techniques, where these aspects are closely related to the domain of SDRE. The criteria are then sorted from highest to lowest based on importance. The criteria used in determining the priority of oil and gas structures/fields are as follows: Resources Assessment, Economic Value, Reservoir Management, Surface – Subsurface Issue, Infrastructure, Structural & Facies Uncertainty, Production, Water Cut, Workplan, IOR/EOR (Figure 5).

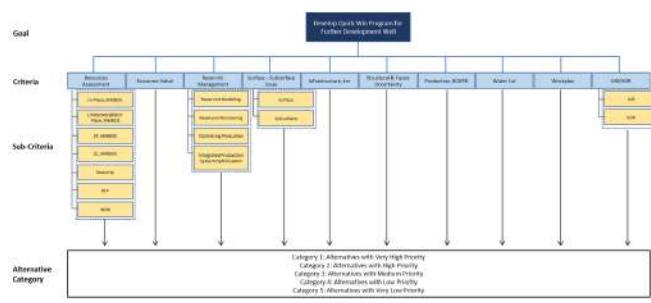


Fig. 5. Alternative Ranking Model

Then, after Weighted Sum Model gives the results, the author presents a simple Value of Information Analysis (VOIA) approach through Decision Tree Analysis. The approach presented here is an additional tool that can be used in the decision-making process. The decision to continue drilling after the funneling/challenge session is determined by evaluating the value of the conceptual model – relative to the cost of the drilling. The Decision Tree Analysis method was also chosen by the author to prioritize the wells to be drilled from the beginning to the end of the year in RKAP 2023, based on each region and the drilling barchart.

Each conceptual model prior to subsequent decisions will have two values to estimate at this point: model reliability and drilling risk (cost of unsuccessful wells). The project will have an Expected Monetary Value (EMV) at initial conditions. The reliability of the model will be determined by defining the drilling success ratio for each region, although this is often considered subjective. To calculate VOI, the Net Present Value of a project is estimated with or without additional activities (Figure 6). NPV is the amount of cash flow from the project evaluated to date

with the required rate of return for the investment of the project (White et al., 1998)

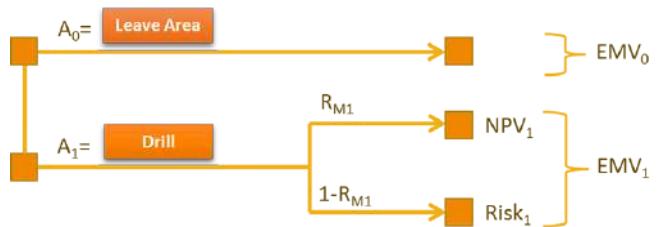


Fig. 6. Decision Tree Model in Quick Win Program Development

3. Implementing Quick Win Program: The implementation of the Quick Win Program is carried out based on the stages of decision-making within the company, starting from the initiation stage, selection stage, further study stage, before finally entering the execution stage (Table 2)

Table 2 - IMPLEMENTATION PLAN SCHEDULE

No	Activities	2023																
		8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1	Initiation Stage																	
2	Selection Stage																	
3	Advanced Study Stage																	
4	Execution Stage																	

At the initiation stage, coordination is needed in the internal organization of SDRE. The Quick Win program will be presented to each expert to be challenged before being brought to a bigger contest. At the selection stage, external SDRE coordination was carried out, especially with organizations of DWI, P&P, and UBPPM. Here, experts collaborate to select proposed wells to be issued in the Quick Win Program. Justification for the proposed wells that will be issued are wells that have obstacles in both surface and administrative aspects, such as problems with POD/FID approval, land permits, delays in UKL/UPL documents, and vendor and technology contracts. At the further study stage, the FEED is compiled to detail the best development concept until it reaches a certain level of maturity and confidence so that it is suitable for use as decision-making material. Finally, at the execution stage, project planning that was prepared previously is implemented through detailed engineering activities under the DWI and P&P organization by taking into account strict risk and uncertainty management as well as project control and monitoring that follows project management rules.

III. RESULTS

Taking into account the Covid-19 Pandemic when this work was taking place, Focus Group Discussions with experts were conducted. Each expert gives weight one by one to each oil and gas field as alternative (Table 3). As many as 202 oil and gas fields have been assessed, which are divided into 191 developing fields, 2 KSOs, and 9 suspended fields.

Table 3 - EXAMPLE OF WEIGHT ASSESSMENT FOR EACH CRITERION

Alternatives	Criteria/Sub-criteria														
	Resources Assessment			Economic Value		Reservoir Management		ISSE		Infrastructure & Uncertainty					
	In Place Net	Remaining In Place	Op	2C	Maturity	WOR	RTP	Reservoir Monitoring	Production Optimization	Surface	Subsurface	Structural Production	Water Cut	WP	IDR/TON
Akasia Bagus	1	1	1	3	5	4	5	5	4	4	2	4	5	5	1
Akasia Maju PDR	1	1	1	2	3	3	3	4	4	4	2	3	4	3	1
Akasia Maju POP	1	1	1	2	5	3	3	4	5	4	2	3	2	4	1
Arjunoenggang	1	1	1	1	1	1	1	2	1	1	3	4	1	2	1
Bambu Besar	1	1	1	2	3	2	3	2	3	2	4	3	2	3	1
Bambu Gunung	1	1	1	2	1	2	1	5	3	4	4	4	2	4	1
Bogor Raya	1	1	1	3	5	2	2	3	3	2	4	4	5	2	1
Cikarang	1	1	1	4	5	3	2	2	3	2	4	4	5	2	1
Cilamaya Selatan A	1	1	1	1	1	1	2	2	3	2	4	4	5	1	1
Cilamaya Timur	1	1	1	1	1	1	2	2	4	3	4	5	4	2	1
Cileunca Utara	1	1	1	1	1	1	2	2	4	3	4	5	4	2	1

After the experts calculated the weight of the alternative assessments for each criterion, the alternative values were then multiplied by the weights of the criteria and added together to produce a total alternative value (Table 4). Furthermore, each alternative is put into a ranking category according to the total value of each alternative.

Table 4 - EXAMPLE OF RANKING DETERMINATION OF EACH ALTERNATIVE

Alternatives	Criteria										Value	Rank		
	Resource Assessment			Economic Value		Reservoir Management		ISSE		Infrastructure & Uncertainty				
	In Place Net	Remaining In Place	Op	2C	Maturity	WOR	RTP	Reservoir Monitoring	Production Optimization	Surface	Subsurface			
Weightage														
Akasia Bagus	3.45	38	16	10	6	7	6	5	9	5	1	377	Very High	
Akasia Besar PDR	1.5	2	2.25	1	4	2	2	2	1	5	1	282.5	Medium	
Akasia Besar POP	1.5	2	2.5	1	4.5	2	2	2	1	5	1	282.5	Medium	
Arjunoenggang	1	1	1.5	0.5	3	3	2	2	1	5	1	178	Low	
Bambu Besar	1.75	4	4.75	0.5	6	3	5	4	0	5	1	373.0	Very High	
Bambu Gunung	1.5	1	1.5	0.5	3	3	2	2	1	5	1	282.5	Medium	
Bogor Raya	1.5	1	1.5	0.5	3	3	2	2	1	5	1	282.5	Medium	
Cikarang	1.5	1	1.5	0.5	3	3	2	2	1	5	1	282.5	Medium	
Cilamaya	1.65	1	0.5	0.5	6	6	6	6	2	1	1	248	Medium	
Cilamaya Selatan A	1	1	2	2	4	2	2	1	1	5	1	142	Very High	
Cilamaya Timur	1.25	2	3.5	0.5	4	3	2	2	1	5	1	248	Medium	
Cileunca Utara	1.15	2	3.5	0.5	4	3	2	2	1	5	1	248	Medium	

Based on the decision analysis using the WSM method, the alternative rankings in the Regional 2 with the following summary: 2 fields in the very low priority category (1%), 56 fields in the low category (28%), 95 fields in the medium category (47 %), 37 fields in the high category (18%) and 12 fields in the very high category (6%) (Figure 7).

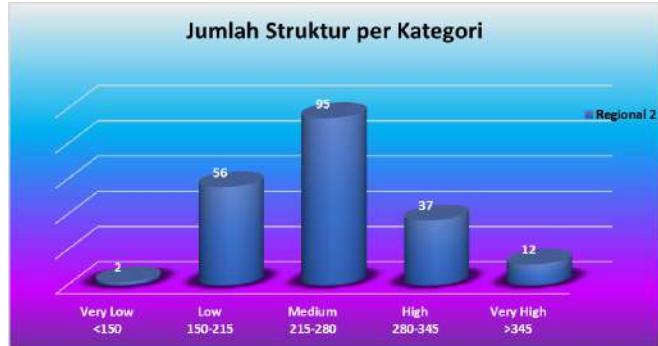


Fig. 7. Percentage of Each Alternative Ranking Category

Oil and gas fields with high and very high category can be interpreted as fields that are prioritized by zones and regions to be developed or are currently being developed, and become the backbone of oil production in Regional 2. Meanwhile, oil and gas fields with moderate to very low category can be interpreted as oil and gas fields that have not been fully exploited (Table 5).

Table 5 - ALTERNATIVE RANKING OF REGIONAL 2

Rank	Zona 5		Zona 6		Zona 7	
	Field	Value	Field	Value	Field	Value
Very High	LL	349	Krisna	349	Subang	347
	KL	349.5			Jatiasri Komplek	365
	ZU	349.5			X-Ray	368
	B3	374.5			Cemara	369
	E Main	394.5			Bambu Besar	373.5
					Akasia Bagus	377
High	E East	281.5	Intan	291	Cilamaya Utara	280
	FC GHU	284.5	Widuri	292	Karang Luhr	280
	FDEM	285.5	NE Intan	311.5	Pondok Makmur	289
	B11	287.5	Cinta	296.5	Akasia Maju	294
	FF	288.5			Karang Enggal	296
	GG	296			Tambun	311.5
	L (PHE)	309			L Parigi	320
	UL	311.5			Melandong	321
	SP	312			Randegan	321.5
	YY	313			Tunggul Maung	322.5
	UX	321			Jatibesar	320.5
	FF	327.5			Gantar	303
	FK	329.5			Pasir Catang	305.5
	BN	302			Karang Baru	308
	K	331			Kayu Merah	332.5
	KLD	340			IJB/Bangadua	342
					Jatibarang	344.5
Medium	AA	215	Lidya	215	Jatinagara	221
	FW	216.5	Yvonne UBR	215.5	Karang Baru Barat	236
	KMS	217.5	East Rama	216.5	Tugu Barat C	245
	ME	217.5	Lastri	218	Cilamaya Timur	246
	UC	232	Nadia	218	Sindang	250
	UD	233	Risma	220	Karang Degan	258
	MJ	233.5	Atti	229.5	Tegal Pacing	258
	MV	233.5	Kartini	229.5	MB 47.4%	261
	MB	234	Kitty	232.5	Akasia Besar	262.5
	KLX	245	North Wanda	234.5	Tugu Barat A	263
	MML	249.5	Lita	235.5	Pasir Jadi	265
	KK	250	Gita	247.5	Sindangsari	222.5
	APNA	250.5	Selatan	247.5	Bojong Raong	229
	ES	260.5	Aida	248.5	Pasirjadinaik	229
	UW	260.5	Yani	249	Tanjungsari	237
	OO	262	South Zelda	256.5	Cicauh	241
	UK	263	Zelda, Banuwati	223.5	Cikarang	242
	GQE	221.5	Minor Gas Fields	224.5	Karang Tunggal	244
	JJA	224	Suratmi	227	Pondok Mulia	251.5
	MKN	225.5	Karmila	227.5	Bambu Gunung	252.5
	UB	227	Nora	228.5	Haur Gede	252.5
	LES	229.5	Indri	237.5	Pondok Tengah	253
	UV	236.5	Vita	237.5	Pegaden	268.5
	ESP	239.5	Mila	238		
	EST	240.5	Wanda	238.5		
	APNB	250.5	Sundari	239		
	APNE	250.5	SW Wanda	240.5		
	APNF	253.5				
	KLY	254				
	OX	256				
	FAB	265.5				
	UA	266				
	YA	268.5				
	UY	271.5				
	FSB	273				
	P	273.5				
	MR	274				
	KKN	275				
Low	NC Java B	161	Savitri	157	Arjawinangun	151
	EWW	176.5	Teresia	196.5	Rengasdengklok N	152
	EWY	176.5	Chesy	199.5	Rengasdengklok O	152
	OY	181.5	Nurbani	209	Pamanukan Selatan	166
	OV	182.5	Asti	211	Pabuanan A	168.5
	NF	183.5	Aryani	211.5	West Gantar	176.5
	BTS	191.5			Pondok Berkah	178.5
	ESR	191.5			Cilamaya Selatan	180
	BZN	193.5			Kandang Haur Barat	181.5
	OQ	194.5			Sukatani	187
	BZZ	195.5			Sambidoyong	188
	FZ	197.5			Haurgeulis	189.5
	FS	199.5			Sindang Turun	191
	AVS	200			Sukamandi	191
	AV	202			Jatirarangan	194
	HZE	202.5			Tegal Taman	194
	APNC	203			Randuwangi	200
	SC	203			Pondok Mekar	200.5
	BLT	207			Jatikeling	207
	OC	208			Kandang Haur Timur	209.5
	FXE	209			Waled Utara	210.5
	FSW	211.5			Rengasdengklok L	213
	OU	212.5				
	UR	212.5				
	SB	213				
	FN	213.5				
	LN	213.5				
	BQ	214.5				
Very Low			Duma	129		
			Retno	134		

Proposed wells of RKAP that have been calculated and produce EMV, are included in each alternative ranking category and sorted by its alternative. Then, after each proposed well is sorted by its alternative, the proposed wells are sorted from high to low EMV values in each alternative ranking category. Proposed wells will be included in the Quick Win Program simulation as an effort to increase oil production at Pertamina (Table 6).

Table 6 - EMV CALCULATION RESULTS TOWARDS ALTERNATIVE RANKING

Zona 5		Zona 6		Zona 7	
Well Proposal	Value	Well Proposal	EMV	Well Proposal	EMV
ZUD-12	3.009	Krisna D-03ST	2.597	BBS-A3	4.253
LLA-5	2.653	Krisna A-15	1.939	ABG-C	2.5
LLD-21	2.093	Krisna C-12ST	0.443	ABG-C1	2.429
LLB-16	1.865	Yvonne-B14	1.085	CMR-ST02	0.003
LLD-20	1.822			MLD-BS	1.78
LLD-22	1.736			CLU-INF1	0.108
ED-14	1.535			HGD-INF1A	1.936
ED-15	1.335			HGD-INF1B	1.563
LLB-14ST	0.846			TTM-A1	0.95
LLE-09	0.068				
FFB-12ST	3.354				
FFB-6ST	1.63				
UXA-9	0.875				
UXA-8	0.637				
MRA-9	4.771				
MRAX-1ST	1.8				
UA-10	3.226				
UA-5ST	2.459				

In presenting the ranking results for proposed wells, mainly there is an onstream date for each proposed well, a monthly decline rate, and a forecast of the average daily oil production rate in each year (Table 7). In the proposed wells ranking, the forecast average rate of production still looks random with the onstream date plan throughout 2023 which is obtained from the UBPPM organization.

Table 7 - PROPOSED WELLS RANKING WITH THE ORIGINAL ONSTREAM DATE PLAN

Zone	Rank	Series	Est. On	Onstream Date	Original	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	
S	1	ZUD-12	SB8		330.0	324.0	318.1	312.3	306.6	301.0	295.4	290.2	284.9	279.7	274.6	270.4	266.2	262.0	
	2	LLA-5	320	Jan-23	-3%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	3	LLD-21	320	Jul-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	4	LLD-22	320	Jul-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	5	LLD-20	320	Jul-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
S	6	LLD-22	320	Jul-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	7	ED-14	250	Feb-23	-2%	250.0	245.9	241.8	237.8	233.9	230.0	225.2	222.5	218.8	215.2	211.6	208.0	204.4	200.8
	8	ED-15	250	Feb-23	-2%	250.0	245.9	241.8	237.8	233.9	230.0	225.2	222.5	218.8	215.2	211.6	208.0	204.4	200.8
	9	LLB-14ST	300	Jan-23	-3%	300.0	296.5	291.1	286.0	280.4	275.0	270.6	266.2	261.8	257.4	253.0	248.6	244.2	
	10	LLB-16	320	Jan-23	-3%	320.0	313.1	307.8	294.5	286.5	278.6	271.0	263.6	256.5	249.5	242.4	235.3	228.2	
S	11	LLB-20	320	Jan-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	12	LLB-22	320	Jul-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	13	UXA-9	315	Dec-23	-4%	315.0	309.8	303.7	297.6	291.2	285.0	278.7	272.3	265.6	258.3	250.9	243.6	236.2	
	14	UXA-8	315	Nov-23	-4%	315.0	309.8	303.7	297.6	291.2	285.0	278.7	272.3	265.6	258.3	250.9	243.6	236.2	
	15	MRA-9	400	Feb-23	-5%	400.0	396.5	393.0	389.5	386.0	382.5	379.0	375.5	372.0	368.5	365.0	361.5	358.0	
S	16	MRAX-1ST	320	Jan-23	-2%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	288.4	283.4	279.1	274.9	270.8	266.7	262.6
	17	UA-10	510	Age-23	-1%	510.0	507.0	504.1	491.4	485.3	478.2	472.0	466.8	460.8	454.4	448.4	442.0	435.6	428.2
	18	UA-5ST	240	May-23	-11%	240.0	241.8	237.8	233.9	230.0	225.2	222.5	218.8	215.2	211.6	208.0	204.4	200.8	197.2
	19	Yvonne-B14	300	Feb-23	-2%	300.0	296.5	291.1	286.0	280.4	275.0	270.6	263.6	256.5	249.5	242.4	235.3	228.2	
	20	TTM-A1	100	Aug-23	-22%	100.0	98.3	96.6	94.9	93.2	91.5	89.8	88.1	86.4	84.7	83.0	81.3	79.6	77.9
S	21	Region 2	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
	22	On Case	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	23	Optimized	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	24	Region 1	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	25	Region 3	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
S	26	Region 4	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	27	Region 5	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	28	Region 6	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	29	Region 7	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	30	Region 8	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
S	31	Region 9	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	32	Region 10	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	33	Region 11	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	34	Region 12	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	35	Region 13	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
S	36	Region 14	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	37	Region 15	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	38	Region 16	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	39	Region 17	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	40	Region 18	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
S	41	Region 19	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	42	Region 20	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	43	Region 21	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	44	Region 22	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
	45	Region 23	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0
S	46	Region 24	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	355.0

using the Weighted Sum Model and Decision Tree Analysis, proposed fields and wells such as Zulu, LL, Krishna, BBS, and ABG rank at the top. This high ranking well is in accordance with the actual conditions in the field.

Decision making analysis in the development of oil and gas fields is proven to be able to contribute time efficiency and effectiveness of drilling from the specified target, due to more mature preparation and planning. With Decision Making Analysis, companies can selectively choose projects that benefit their business through the decision-making stages from the initiation stage, selection stage, further study stage, before finally entering the execution stage. DMA can also participate in determining decisions between organizations that are more integrated with decision making that remains objective.

V. CONCLUSION

The Quick Win Program in Regional 2 is one example of the successful use of the Decision-Making Process. A similar program can also be used as an analogy and can be applied in other Regional in the Subholding Upstream. The implementation of the Quick Win Program can still be improved by adjusting the proposed wells for certain months of production (especially January and December 2023) to increase the production forecast above the target, as input for the management team as decision makers.

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Paper 83

Selecting Potential Location to Integrate Shuttle Bus as Public Transportation in Jakarta Suburban Area Using Analytical Hierarchy Process (Study Case: JakLingko Indonesia)

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract – JakLingko Indonesia provided integration of public transportation in Jakarta and its tariff, would expand the business to cover public transportation integration in a sub-urban area. The aim of this research is to determine the prioritization of potential locations to integrate shuttle buses as public transportation in suburban areas based on stakeholders' preferences. AHP method is used to analyze the data to get the location prioritization. The data was obtained by using qualitative and quantitative data. To develop the AHP hierarchy structure, data was gathered from interviews with stakeholders, brainstorming, and literature review, then the questionnaire to know the preferences of the stakeholders. There are four criteria and ten sub-criteria obtained. The criteria are socio-demographic, financial, demand pattern, and distance. While the sub-criteria obtained are age, population, income, profit sharing, investment cost, activities, vehicle ownership, origin to destination, origin to the closest station, and commuting expenses. AHP hierarchy structure was tested with four alternative locations which are Bekasi City, Depok, Tangerang Regency, and Bogor Regency. The result of the calculation is Depok has the highest score among others.

Keywords – AHP, Decision Making, Integration, JakLingko Indonesia, Potential Location, Public Transportation

I. INTRODUCTION

JakLingko is a company that handles and provides integrated public transportation and its payment method in the Jakarta area. Nowadays, public transportation in Jakarta is used by most people in their daily life. The integration payment method aims to make the fare cheaper and covers all of society. The initiative required a combination of all public transportation in Jakarta such as MRT, LRT, KCI, TransJakarta, and MikroTrans. Reference [6] shows, that to increase the number of usages of public transportation, the service of public transportation should be designed to accommodate the level of service required by the customer so it will be attracted, potential users. Integrating public transportation and tariff is one of the services of public transportation which will provide for people's needs especially those who live in suburban areas.

The number of commute people in Jakarta is high and everyday people did mobilization. As in [2], the number of

commuting people in DKI Jakarta is 1,253,771 people from the surrounding city which are Bogor Regency, Bogor City, Depok, Tangerang Regency, Tangerang City, Tangerang Selatan, Bekasi Regency, and Bekasi City. The highest number of activities is from Depok with 296,488 people and Bekasi City with 277,234 people. Since the residents in the buffer zone are far from public transportation, the behavior of people is tended to use a private car which brings the traffic problem. Also, the private-public transportation shuttle bus is costly for some people. The availability and accessible public transportation facilities become a consideration in choosing a property. Moreover, the tariff and the convenience of public transportation is the important factors to determine the usage of public transport. The integrated tariff and public transportation will be made users efficient in time and cost. Reference [5] shows that the integrated public transportation model would save time and money for the users, and also increase the incomes of bus providers and private public transport operators. Most of the people who live in the BODETABEK area are working in Jakarta, and the numbers of workers have pointed out the importance of public transport in their daily commute. To increase the quality of mobility and accessibility of the BODETABEK area, the integration of public transportation is needed. Integration of public transportation will reduce the number of traffic jams and make add value to the area which is more accessible.

Most of the residents in the buffer zone of Jakarta are provided with a shuttle bus since the distance from the residence to the public transport is far, but the shuttle bus usually charges a high price. Looking at the current situation, the users have a limited choice to use public transportation. The need for public transportation is tended to be high since most Jakarta workers live in the buffer zone of Jakarta. As in [1], the number of Jakarta residents who live near transit terminals is only 44%, while the number of suburban residents is lower which is only 16%. Public transport which indeed supports seamless multi-destination travel will attract a higher volume of passengers. The location of the residents will be more attractive with the development of a strong public transportation corridor, especially with the integration of public transportation and tariff. Reference [4] shows that, the strong public transportation corridor will reduce the random travel patterns since the development of the housing will be concentrated along the corridors.

Currently, JakLingko integrating all public transportation and the tariffs in DKI Jakarta and the payment will become seamless. Reference [3] shows, that the passengers are allowed to use several public transportations by implementing an integration tariff system. The passengers could buy the ticket based on their preferences in choosing the public transportation modes. JakLingko application system provides several price ranges, from the economic route which provides cheaper prices, and the fastest route usually more expensive. The focus of this research is knowing and determining the potential location for JakLingko Indonesia to expand its business by integrating public transportation, especially shuttle buses to provide integrating public transportation journeys by capturing the buffer zone with most Jakarta workers living in an already facilitated by shuttle bus in each location. Also, knowing the stakeholders' preferences and their consideration in selecting the priority location to integrate the shuttle bus since they are the decision maker. The decision-making method selects the right potential location for JakLingko to expand the business is needed since it would give benefit both parties. JakLingko's purpose is to make the payment seamlessly and efficiently to users and provide all users' needs related to payment.

II. METHODOLOGY

The methodology used to formulate the decision of business expansion of the company is using Analytical Hierarchy Process (AHP) to support the prior analysis. Analytical Hierarchy Process could address the potential location to integrate shuttle buses as public transportation for JakLingko Indonesia to expand the business. AHP method would be more detailed, measurable, and scientific since most of the data is combining the input, opinion, and judgment from the stakeholders related. Moreover, the AHP method is usually used to make prioritization the alternative which required a complex decision maker and simplifies the decision. Therefore, alternative priorities can be determined.

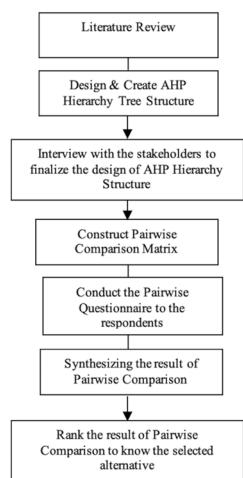


Fig. 1. Conceptual Framework of Decision-Making Process

Table 1 - Modification Scale of Intensity of Importance

Intensity of Importance	Definition	Explanation	Modification on Likert Scale
1	Equal Importance	Contribute equally to the objective	5 on Likert scale 4 if left criterion is moderate importance than the right criterion 6 if right criterion is moderate importance than the left criterion 3 if left criterion is strong importance than the right criterion 7 if the right criterion is strong importance than the left criterion 2 if left criterion is very strong importance than the right criterion
3	Moderate Importance	One criterion over another is slightly favor	3 if left criterion is strong importance than the right criterion 6 if right criterion is moderate importance than the left criterion 4 if left criterion is moderate importance than the right criterion 5 if right criterion is moderate importance than the left criterion 1 if left criterion is strong importance than the right criterion 2 if right criterion is strong importance than the left criterion
5	Strong Importance	One criterion over another is strongly favor	7 if the right criterion is strong importance than the left criterion 8 if right criterion is very strong importance than the left criterion 2 if left criterion is very strong importance than the right criterion 9 if right criterion is very strong importance than the left criterion
7	Very Strong Importance	One criterion is favored very strongly over another	1 if left criterion is extreme importance than the right criterion 8 if right criterion is very strong importance than the left criterion 9 if right criterion is extreme importance than the left criterion
9	Extreme Importance	One criterion favoring one criterion over another is the highest possible order of affirmation	1 if left criterion is extreme importance than the right criterion 9 if right criterion is extreme importance than the left criterion

As in Fig. 1 is the framework of the decision-making process. The calculation of the AHP method can be done by determining the criteria and sub-criteria developed through the interview with the stakeholder, then questionnaire to the respondents to get the preferences from the respondents to know the priority judgment in pairwise comparison. The respondents in this research are the stakeholder from the company that has deeply understood the whole business in the company. Furthermore, the interviewees in this research as the decision maker which determine the continuity of the business expansion. The respondents are the director, head of the corporate strategy, and head of the business strategy and development. The interview and filling out the questionnaire have been done in an online session. Due to the online session in filling out the questionnaire, the pairwise comparison is using google form and the Likert Scale.

Since the pairwise comparison did in the online form and the Likert scale was divided into two criteria as a comparison, the even number on the scale is not used. The results of the pairwise comparison were calculated by the AHP calculation excel template from bpmsg.com developed by Klaus D Geopel. The data analyzed was used to know the consistency and the weight of each criterion and sub-criteria. The quantitative data from the literature is normalized to be able to calculate using the AHP

method. Then, the results of the calculation were tested with the alternative location to get the place prioritization.

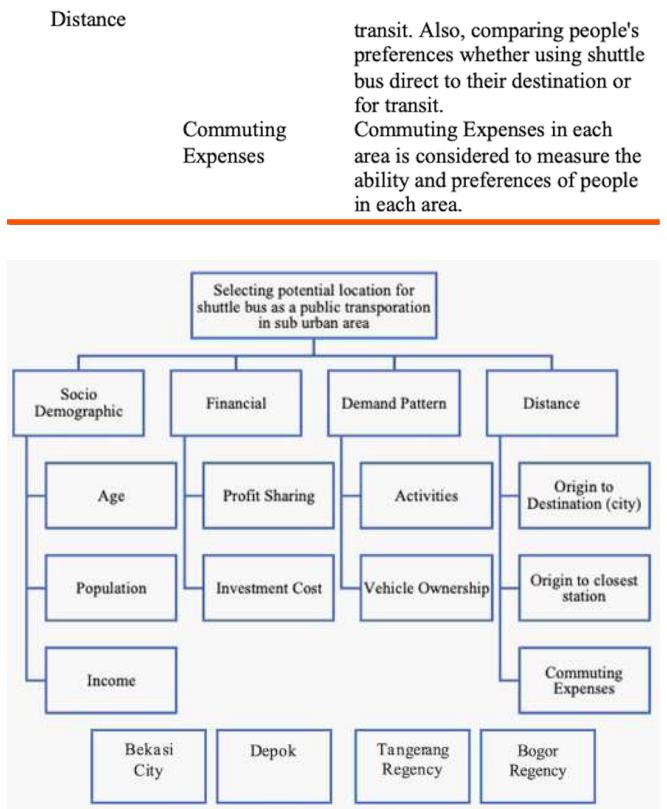
III. RESULTS

The data that has been collected from the brainstorming, interview, and literature review were used for determining the criteria and sub-criteria in the AHP structure model. As in table 2, the criteria that have been determined are socio-demographic, financial, demand pattern, and distance. In determining the sub-criteria, the authors get the sub-criteria that has similarities with each other. The sub-criteria determined are age, population, income, profit sharing, investment cost, activities, vehicle ownership, origin to destination, origin to the closest station, and commuting expenses.

As in Fig. 2, the criteria and sub-criteria were determined from interviews with the stakeholders, brainstorming, and literature review, then the AHP hierarchy structure was made. The alternative potential location was mapping and chosen from the route of the shuttle bus that has been operated around the Jabodetabek area. This is meant to make the partnership between stakeholders. The alternative locations are Bekasi City, Depok, Tangerang Regency, and Bogor Regency, which have a high number of people commuting.

Table 2 - Criteria and Sub-Criteria Description

Criteria	Sub Criteria	Description
Socio Demographicic	Age	Usually, the productive age commutes more in their daily and affect the activity.
	Population	The population in an area, could determine the demand of public transport itself.
	Income	Determine the preferences of public transport used and knowing the people preferences whether using public transport or private transport.
	Profit Sharing	The profit sharing between JakLingko and the business partner like operator and developer will be the consideration, since it is business to business partnership.
Financial	Investment Cost	The investment cost needs to be considered since it needs some installation infrastructure in a shuttle bus.
	Activities	Know the journey pattern of each people and the transportation they used.
Demand Pattern	Vehicle Ownership	Knowing the proportion estimation between people who used private vehicles every day and used public transport as daily transportation
	Origin to Destination	Knowing the preferences of people to use public transport directly. Also, knowing the proportion in an area that used shuttle bus directly to their destination.
	Origin to Closest Station	Sizing the number of people who commute every day and do



As in table 3, the result of the calculation has been collected. The interview that has been conducted to finalize the criteria and sub-criteria is continued with the pairwise comparison in each criterion and sub-criteria resulting in the weight of each criterion and sub-criteria to know the prioritization. Then, the global weight of each criterion will be gotten by calculating the local of each sub-criteria and multiplying the weight of the main criteria.

Table 3 - The Weight of The Main Criteria and Sub-Criteria

Object ive	Criteria	Local Weig ht	Sub Criteria	Local Weigh t	Global Weight	Rank
Select and determ ine the potenti al locatio n for shuttle bus as a public transpo rtation in sub urban area.	Socio Demographi c	10,1%	Age	20,90 %	2,11%	10
			Population	41,10 %	4,15%	6
			Income	38,10 %	3,85%	7
			Profit Sharing	12,8%	3,60%	8
			Investment	87,20 %	24,5%	2
	Demand Pattern	28,1%	Cost	42,5%	10%	5
			Activities	90%	38,25%	1
			Vehicle Ownership	90%	4,25%	5
			Origin to Destination	50,5%	9,70%	3
			Origin to Closest Station	19,2%	32,7%	4
			Commutin g Expenses	16,8%	3,23%	9

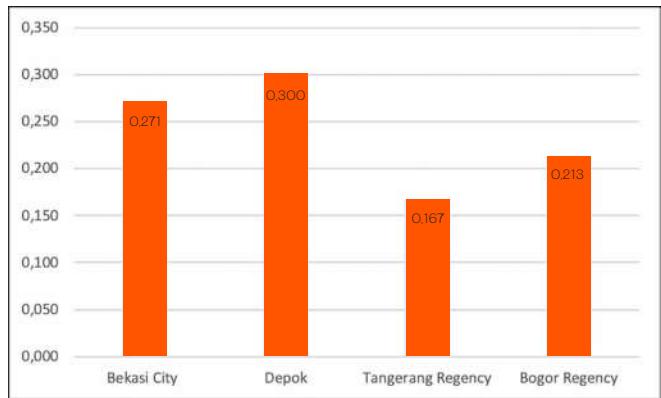


Fig 3. The Total Score of Alternative Location

As in table 3, the highest value gets from the calculation for the criteria is the demand pattern which has a local weight is 42,5%. The second criteria are financial with a local weight of 28,1%, followed by distance with 19,2%, and socio-demographic 10,1%. While the highest global weight of the sub-criteria is an activity with a total global weight of 38,25%, then the sub-criteria investment cost with a total global weight of 24,5%, followed by sub-criteria origin to destination with 9,7% and origin to the closest station with total global weight 6,28%.

The score of the alternative location getting from normalization data in each sub-criteria multiply by the global weight in each sub-criterion. As in Fig 3, Depok has the highest score as the priority alternative to selecting a potential location for a shuttle bus as a public transportation in a suburban area with a total score of 0,3. Then, Bekasi City with a total score of 0,271. Followed by Bogor Regency with a total score of 0,213 and Tangerang Regency with a total weight of 0,167.

IV. DISCUSSION

Analytical Hierarchy Process analysis can be used to determine and select the potential location for JakLingko Indonesia to expand the business of integrating public transport like shuttle buses. To continue the selection of potential locations and the possibility of changing the structure and sub-criteria in the AHP tree, JakLingko Indonesia management could execute some processes similar to the analysis process before. Currently, JakLingko Indonesia wants to cover all areas by integrating public transportation, including shuttle buses. AHP analysis could help the company to determine the priority alternative, in this case, selecting a potential location to be integrated with a shuttle bus as a public transportation and covered suburban area of Jakarta.

Of all the criteria, the highest value is the demand pattern and the lowest value is socio-demographic. In this case, the demand pattern means the journey pattern in each

user in daily mobilization, and socio-demographic is the characteristic of the population in an area. This result means that the most important criterion from the stakeholder to integrate shuttle buses is the journey pattern of each user in an area instead of the characteristic of the population in the area. The demand pattern criteria also could determine the demand for the integrating shuttle bus. From the data calculation, results obtained for the priority location to integrate shuttle buses as public transportation from sub-urban to Jakarta City is Depok.

V. CONCLUSION

AHP tree model used for analyzing the priority of potential location in integrating shuttle buses as public transportation is determined from the stakeholders' interview and literature review. The criteria and sub-criteria that developed from the interview and literature review consist of four criteria which are socio-demographic, financial, demand pattern, and distance. Each criterion also consists of sub-criteria to analyze the alternative. The sub-criteria socio-demographic consists of age, population, and income. The sub-criteria financial consist of profit sharing and investment cost. The criteria demand pattern consists of activities and vehicle ownership. The last criteria are distance which consists of origin to destination, origin to the closest station, and commuting expenses.

After getting the AHP tree structure model, the author created the questionnaire to get the preferences of each respondent about each criteria weight. The questionnaire form used the google form since it is convenient and more familiar to the respondents. After getting the results, the data were analyzed by the AHP calculation excel template from bpmsg.com developed by Klaus D Geopol. The data analyzed was used to know the consistency and get the weight of each criterion and sub-criteria. Then, the criteria and sub-criteria are tested with the alternative location to know the priority of the potential location. The result of the priority is Depok, Bekasi City, Bogor Regency, and Tangerang Regency. Depok has the highest value to be the first prioritization location for integration, it is also similar to the number of activity data in which Depok has the highest number of activities among other areas. Besides that, there are criteria that become the consideration for the stakeholders in selecting the integrating area. The most considered criteria is the demand pattern, which means the journey pattern of the users in their daily commute.

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Paper 84

Scenario Planning Development for Public Transportation
in Jakarta to Achieve Net Zero Emission

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - Indonesia is one of the countries that participated in the Paris Agreement, the international pact concerned with reducing global warming growth by targeting to achieve Net Zero Emission (NZE) in 2060 or earlier. One of the sectors that can be implied to reduce the emissions produced in the transportation sector. This research aimed to identify the challenges and plausible scenarios for public transportation in Jakarta in the upcoming ten years to achieve net zero emissions. The method used in this study was qualitative by interviewing several stakeholders. The interview results were analyzed and written into a transformative scenario. The sequence of scenarios is implemented based on urgency to achieve the ideal situation according to the interconnection analysis of each factor with high impact and uncertainty. It results in five scenarios, namely 1) Gridlock and Pollution, 2) Stopping at Red Light, 3) Green Light to Go, 4) Getting There, and 5) Green and Connected. Therefore, it is expected that the public transportation providers cooperate with the Government, regulators, and firms related to their operation to achieve net zero emission in 2032.

Keywords - Scenario Planning; Public Transportation; Net Zero Emission.

I. INTRODUCTION

In this modern era, many technologies are often found to make human life more manageable. However, this convenience does not deny the negative side of global warming. Global warming is a form of ecosystem imbalance due to increasing the average temperature. If not controlled immediately, global warming can harm human life, such as sea-level rise, temperature increases beyond the limits of human adaptation, prolonged drought, etc.

To avoid this problem, various countries are making efforts to reduce the growth of global warming through the Paris Agreement. The Paris Agreement is a legally binding international treaty on climate change adopted by 196 Parties at COP 21 in Paris on December 12, 2015 and entered into force on November 4, 2016 [1]. The Paris Agreement aims to slow global warming by maintaining it below 2, preferably 1.5 degrees Celsius. There are three ways for countries involved in the Paris Agreement to support each other to achieve their goals: financial, technical, and capacity-building support.

One of the countries that participated in the Paris Agreement is Indonesia. In November 2021, Febrio Kacaribu, Head of the Fiscal Policy Agency (BKF) of the Ministry of Finance (Kemenkeu) explained to the press that in the 2021 NDC update document, through the long-term strategy – low carbon and climate resilience (LTS – LTCCR) Indonesia has also targeted to achieve Net Zero Emission (NZE) in 2060 or earlier [2]. Achieving this takes much participation by various parties, both public and private.

One sector that can provide an immense contribution is the transportation sector. People need transportation to move to various places to carry out activities. As the capital city of Indonesia, Jakarta is the country's representative. According to the TomTom Traffic Index in January 2021, cited from [3], Jakarta ranks 31st out of 416 cities of the World's Worst Cities for Traffic Jams in 2020. One of the causes of congestion, in general, is the high number of private vehicles. According to the research conducted by the Central Bureau of Statistics of Indonesia, the number of private vehicles such as private cars and motorcycles has been rising in significant numbers for the last couple of years. In percentage, private cars have increased 0.60% (2018 - 2019) and 9.94% (2019 - 2020) while motorcycle has increased 0.72% (2018 - 2019) and 96.97% (2019 - 2020). The details of its numbers are shown in the table below:

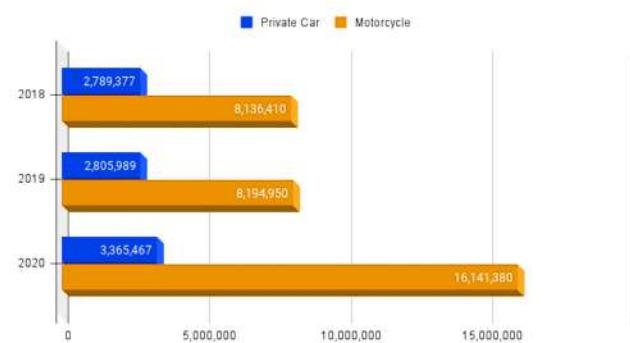


Fig. 1. Number of Motorized Vehicles by Vehicle Type (units) in DKI Jakarta Province 2018-2020. Source: [4]

Therefore, noting that the number of private vehicles arises so fast that it may cause gridlock and environmental pollution, the Government, with the help of public transportation operators in Jakarta, needs to be present

more deeply to attract people to shift from private vehicles to public transportation that friendly environment to achieve net zero emission.

This research aimed to identify the challenges and plausible scenarios for public transportation in Jakarta in the upcoming ten years to achieve net zero emissions. The research started with exploring the issue by conducting industry analysis throughout PESTEL and literature review. Furthermore, to have a deeper understanding of Jakarta's public transportation industry due to the realization of Net Zero Emission, this research also interviewed several experts from stakeholders that comprehensively understand public transportation and the implementation of net zero emissions in their respective firms.

The interview aims to capture the steps taken, the challenges, and the driving forces that have high impact and uncertainty, which may drive the implementation of net zero emissions in their respective firms. The interview results then used to be the primary material for scenario analysis to achieve net zero emission for public transportation in Jakarta.

II. METHODOLOGY

The research was conducted through qualitative methods. Meanwhile, the literature review is useful as basic reference material to determine the theory to be used in this study. In addition, the literature review is needed to help the author capture the industry's environment and interview to get the insight of every stakeholder involved in the industry so the author can have a broad understanding before developing the key focal issue.

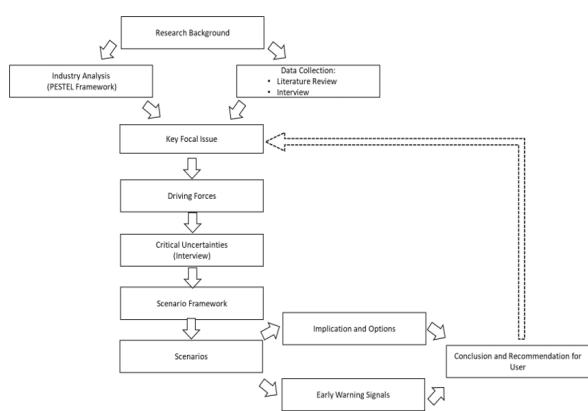


Fig. 2. Research methodology.

PESTEL model is a framework that categorizes and analyzes six important segments: Political, Economic, Socio-cultural, Technological, Ecological, and Legal, that might impinge upon a firm and create both opportunities and threats for the firm [5]. In this study, PESTEL is also used to be the basis of interview questions to dig deeper into how each factor in PESTEL influences the implementation of net zero emissions in public transportation according to the stakeholders involved.

The early shift to net zero emission must bring uncertainty to the public transportation industry. This study uses scenario planning to bring an ease for stakeholders involved in facing uncertain conditions. The term scenario has many meanings, ranging from movie scripts and loose projections to statistical combinations of uncertainties [6]. However, if examined in more depth, the existing combination of uncertainties can be used as the basis for a plan to tackle the impact of uncertainties in the future, which we can call scenario planning. Reference [7] show one of the definitions of scenario planning as an effective futuring tool that enables planners to examine what is likely and what is unlikely to happen, knowing well that unlikely elements in an organization are those that can determine its relative success.

Making scenario planning has many benefits that can help policymakers in Government or decision-makers in a company prepare things to help their firm stay afloat amidst the uncertainties. The benefit of scenario planning lies in its ability to anticipate the future, thereby improving the potential of an organization to better respond to future events [8]. It also empowers professional planners by making them aware of the different ways the future may unfold for their communities—regardless of their scale or resources [9]. Considering its impact, scenario planning is often used in various areas. For example, it is widely used in military planning, business planning, emergency preparedness, disaster planning, and other applications, including education, environmental policy, health, and the pharmaceutical industry [10].

In conducting scenario planning, there are several components that we must put concerns and stages to be passed so that our scenario planning can be right on target and valuable for the firm or stakeholders we helped. Reference [11] defined several scenario planning components and stages. When combined, all these elements can create a multidimensional future vision. The methodology is depicted in the figure below, along with the elements in the green box and their relationships.

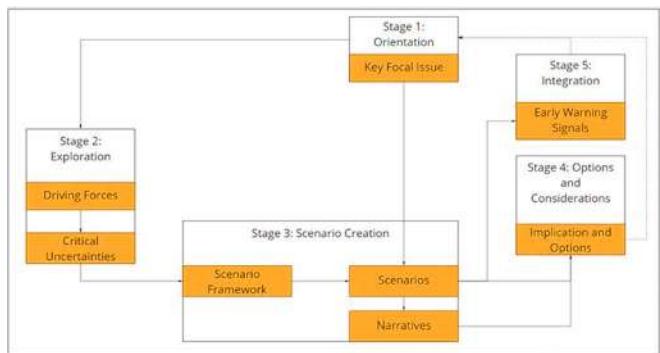


Fig. 3. Methodology and elements of scenario planning. Adapted from [11] as cited in [12]

In order to figure out stage 1 and stage 2, this study conducted interviews with eight experts from the stakeholders involved in the public transportation industry. These experts are business expansion – rail-line based company A (1) fleet evaluation & development – road-based company (2) external relations & corporate image care – rail-line based company B (3) president director – integrated payment company (4) VP transport & mobility – ride-hailing company (5) energy analyst – regulators (6) associate professor – ITB (7) and expert – state-owned enterprises energy (8). Due to the COVID – 19 pandemics, the interviews in this study were carried out in April – July 2022 via Zoom and phone calls. Therefore, the technique of determining respondents in this study was carried out purposively, namely, selecting sources assessed according to research needs and capabilities to provide the information researchers need.

III. RESULTS

In stage 1, based on the interview conducted with several stakeholders, the Authors find issues that may prolong NZE's realization of Public Transportation in Jakarta. Therefore, the key focal issue is "What steps need to be taken to achieve Net Zero-Emissions in the next ten years?". Besides that, the interview conducted with several stakeholders is codified and visualized. It aims to provide an overview of what steps have been taken by public transportation providers, their challenges, and the steps they need to take to improve the implementation of the Net Zero-Emission program. As a result, several steps have been taken by public transportation providers in Jakarta, which are: 1) Raise public awareness, 2) Electric vehicles (EVs) implementation, 3) Emission check services, 4) Integrated payment, 5) EVs battery ecosystem development, 6) Roadmap development, 7) Carbon offset incentives, 8) Renewable energy plan, and 9) Battery swap.

Nonetheless, in doing all of those steps above, public transportation providers may face different challenges,

depending on their offered services. From the in-depth interview activities conducted by the author, the respondents also gave information about the challenges they currently face in accelerating the net zero-emission program in their firm. All the challenges mentioned by the respondents are 1) Infrastructure readiness, 2) Economic readiness, 3) Technology scarcity, 4) Surplus electricity, 5) Law implementation, 6) Lack of regulation support, and 7) Lack of public awareness.

In addition, the authors also discussed the steps that needed to be improved to accelerate the implementation of the Net Zero-Emission program in the Public Transportation Industry in Jakarta. This effort is needed to capture their point of view and plans in the next couple of years so that in the making of scenario, the authors can have a broader view of the issue that may prolong and accelerate the implementation. There are some steps mentioned by respondents that need to be done by stakeholders involved are 1) Push and pull policy, 2) Scale up electric vehicles (EVs) implementation, 3) Renewable energy certificate, 4) Energy transition, and 5) Energy saving.

In stage 2, the authors are trying to identify the driving forces of the Net Zero-Emission program in Public Transportation in Jakarta. To capture it, the author questions how each factor that consists of political, economic, socio-cultural, technology, environmental, and legal or namely PESTEL, can affect the program and how it becomes the driving force with the highest impact and highest uncertainty. All the respondents' answers were then codified and visualized to summarize these issues, as shown in figure 4, for the highest impact:



Fig. 4. Driving forces with the highest impact on the realization of net zero-emission in public transport (Size of each box represents how often the respondents mention the factors)

In addition, the factors that become the driving forces with the highest uncertainty are shown in figure 5 below:



Fig. 5. Driving forces with the highest uncertainty on the realization of net zero-emission in public transport. (Size of each box represents how often the respondents mention the steps)

Based on the interview conducted, four factors have a high impact and high uncertainties mentioned by the respondents, as shown in the table below:

Table 1 - DETAILS OF DRIVING FORCES WITH HIGH IMPACT AND UNCERTAINTY

High Impact	High Uncertainty
Economic (Economic Readiness, Economies of Scale, and Lack of Economic Support)	Socio-culture (Public Awareness and Willingness)
Technological (Technological Development and Transfer knowledge)	Economic (Economies of Scale and Economic Growth)
Legal (Incentives Regulation, Policy Period, Law Enforcement)	Political (Political Willingness, Presidential Terms, and Political Resilience)
Political (Political Decision and Political Willingness)	Legal (Implementation Plan and Complex Bureaucracy)

Therefore, instead of choosing which top two factors have the highest impact and uncertainty, the author built a scenario based on all those factors. Considering that all factors have interconnection, the implementation will not run well if we take out one from the group.



Fig. 6 Interconnection between each factor.

In addition, noting that legal is an output of political action and willingness, the authors decided to group these two into one factor named regulation. The interconnection of each factor is visualized above and described below. The orders of category in the design are built based on what should be the priority according to the interview result and the author's assumption:

1. Interconnection of Regulation to:

- o Economics

Regulation will be a determining factor in helping public transportation providers to achieve net-zero emissions. When the Government later stipulates applicable regulations as a reference for the public transportation industry, especially Jakarta, to perform net-zero emissions, these regulations will have the power to bind public transportation providers to implement net-zero emissions, which will enforce them to prepare the Economic Readiness.

- o Technology

Other than enforcing the public transport provider to prepare their economic readiness to implement EVs and technology related to renewable energy that may be useful to achieve net zero-emission, the Government should give incentives to the firm/public transportation provider. It will make them attracted to shift into environmentally-friendly technology. Incentives are needed by considering the price of technology to implementing net zero-emission is kindly expensive. Therefore, incentives such as tax or else, hopefully, can ease the financial burden carried out by the public transport provider.

- o Socio-culture

In addition to encouraging the implementation of net-zero emissions through the economic factors of public transport providers and technology, the Government may also accelerate it by giving incentives to the public. It is all needed considering that the technology investment to support net zero-emission is expensive, so the public transport provider should raise the cost of the services to cover up the investment. The incentives to gain higher rates of users can be imposed through public service obligations so that the usage cost paid by the customer can be more affordable. In the situation where the Government didn't provide incentives to socio-culture factors, along with the usage cost of private vehicles such as two-wheelers being lower than using public transport, the failure possibility of public transportation is high. As a result, the investment that all stakeholders involved spend does not reach the maximum benefits.

2. Interconnection of Economic to:

- o Technology

In a condition where the Government has enforced the public transport provider to prepare their economic readiness and give incentives to those willing to shift to environmentally friendly technology throughout regulation, the economy and technology factors will have an interconnection. The interconnection happens in the form of research and development, where the public transport provider has economic readiness and help from the Government through incentives.

3. Interconnection of Technology to:

- o Economic

When technology gets support from regulations in the form of incentives and public transport providers have economic readiness, research and development will be created. This research and development activity will result in the interconnection between technology and the economy, which is economies of scale, where the production of a technology increases and makes the technology become something familiar, leading to higher cost-saving for public transportation providers.

- o Socio-culture

In a condition where technology is getting cheaper because it has reached the point of economies of scale, this will result in more public transportation providers able to provide technology such as EVs, charging stations, solar panels, and others. Furthermore, the more widespread technology is used, it will increase public awareness of net-zero emissions and related technology. In addition, support from the Government for socio-culture, such as incentives in the form of public service obligations that result in lower prices for public transportation services, can increase public willingness to use public transportation services so that investments made by public transportation providers achieve maximum benefits.

In stage 3, based on the interconnection analysis of each factor above, it can be concluded that regulation plays an important role. It relates to political actors' impact of applying regulations on other factors. However, to achieve net zero-emission in the public transportation industry, the Government must cooperate with the public transport providers involved so that the conditions created are not only environmentally friendly technology, but users of public transport also have a high level of public awareness and willingness so that it can provide maximum benefit.

In addition, the sequence of stages will be implemented based on urgency to achieve the ideal situation based on the interconnection analysis of each factor above, and the form of the scenario used in this study is the transformative scenario. The scenario framework in this study will consist of four different stages before the implementation of net zero-emission in the public transport industry in Jakarta

achieves the ideal condition that the author aims for, as can be seen in figure below:

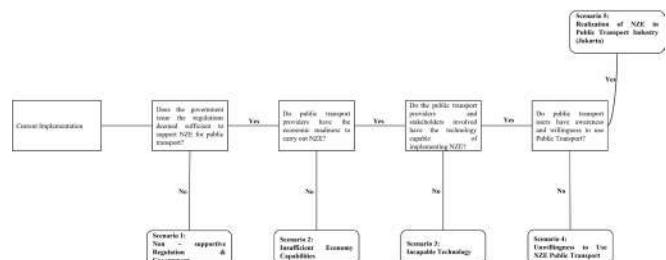


Fig. 7. Scenario Framework for Public Transportation in Jakarta to Achieve Net Zero Emission.

Each scenario in the framework will run for the next ten years, or 2032 by considering the results of interviews with several public transport providers targeting a total shift to environmentally friendly such as EVs and the application of renewable energy in the range of 2030 – 2035.

Each scenario above will be named and given headlines to represent its situation. In addition, the details of each scenario will then be described in narratives to capture how one scenario affects the other and the condition of the implementation of net zero emission in the public transportation industry in 2032.

Naming each scenario uses a vehicle's movement and its type. For example, ICE vehicles are illustrated with exhaust smoke, and EVs are represented with electric plugs. All these illustrations represent the complexity of shifting to environmentally friendly vehicles and the changing habits from using private cars to public transportation. Considering that the form of the scenario is a transformative study, the direction, the number of private and public vehicles, and their types (such as ICE and EVs) represent a transformation process from one scenario to another

Table 2 - SCENARIO TITLE AND HEADLINE

Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Headlines	Gridlock and Pollution	Stopping at Red Light	Green Light to Go	Getting There	Green and Connected
Illustration					

Scenario 1, Gridlock and Pollution, defines the conditions and constraints faced by the Government and public transportation in Jakarta in overcoming pollution problems caused by congestion. One of the solutions is to shift to net zero emission programs in the future. However, the name and illustration are trying to represent the worst possibility of government participation in net zero emission without providing support and supportive regulation. For example, the transition of public transportation providers back to using ICE vehicles and the failure of public encouragement will likely cause gridlock and pollution to the precedent level before planning to shift to net zero emission.

As for scenario 2, the Stopping at Red Light means that all stakeholders stand in place without moving towards their goals. It may illustrate the conditions where public transportation providers know where they should go through the Government's national plan and regulatory support. However, they cannot move because the red light or, in this case, economic readiness constrain them from reaching their destination.

Scenario 3, the Green Light to Go, means the resumption of all stakeholders after the stop caused by the precedent scenario. It may illustrate the conditions in which the Government provides support, and public transportation providers have economic readiness to shift, which means they are moving one step at a time. But unfortunately, they do not have technological capabilities, so they must do research and development. In addition, the public transportation provider does not know what will happen next in the vehicles that start to move after the green light is on. Whether they will be available to move towards their goal or should stop their movement, in this case, the technological research and development because the green light has turned red.

Otherwise, in scenario 4, the Getting There is a condition where the Government is supportive, and public transportation providers have economic and technological capabilities, which may seem easy for them to shift to net zero emission. The shifting of public transportation providers to NZE is faster than the precedent scenario. Therefore, as seen in the illustration, the number of environmentally friendly vehicles is still low compared to environmentally friendly vehicles. In conclusion, the Government and public transportation providers should find a way to move faster by raising public awareness and willingness to use public transport. Otherwise, the impact of shifting may not reach its maximum advantages.

The ideal condition is scenario 5, Green and Connected. It illustrates the four main parts of implementing net zero emission: regulation, economic readiness, technological capabilities, and public awareness – willingness fulfilled which may help them shift to net zero emission as fast

as possible. As seen in the illustration, the numbers of ICE vehicles, either private or public transportation, are zero, while the numbers of environmentally friendly public transportation arising and taking a way to reach their destination without any constraint.

Stage 4 will describe how each scenario may cause implications involving the change in government regulation, economic readiness and technological capability of Public Transportation providers, and public habits.

- o Implication on Regulation

Scenario 1 is mainly caused by the political action that hasn't been ready to set the target. Yet, the regulations do not match the public transportation providers' needs. Other than that, some other things, such as policy period, and presidential terms, also affect the implementation of net zero emission since it may be giving the public transportation providers some uncertain conditions they have to deal with. All these causes may happen by the complex bureaucracy and political willingness. Unsupportive regulation will likely burden public transportation and put them in an uncertain situation to implement NZE.

Scenario 2 is a condition where the regulators or political actors have set out the target and yet support the public transportation providers by providing a supportive regulation that matches their needs. The political actors are highly willing to support net zero-emission, as seen from the imposed regulation built by the interaction between the regulator and public transportation providers. A regulation can be made at no specific time. It may take a short period, or it may take longer. However, the lack of economic capabilities that the public transportation providers have may prolong the implementation of the regulation, which will likely extend the implementation of net zero emission in the long run.

Scenario 3 is a condition where the regulators or political actors have set the target and provided a supportive regulation that matches the public transportation needs. In addition, the public transportation providers have an economic readiness to implement the regulation and reach the target set. However, the technology needed to implement net zero emission in Jakarta hasn't been ready. Therefore, they must research and develop to massively expand the implementation. The research and development may take time. For example, the acceleration of EVs buses implemented by the road-based transportation providers from 30 to 100 bears a year to be implemented. In order to accelerate it, regulations such as incentives must be given to the firm that is likely to shift and do R&D for the technology may be imposed by the Government.

Scenario 4 is a condition where the regulators or political

actors have set out the target and provided a supportive regulation that matches the public transportation needs while supported with the economic readiness and technological capabilities owned by the public transportation providers. The regulation imposed may take part in building the economies of scale in the technical aspect, so the amount of investment that the public transportation needs to spend is likely decreased, followed by the massive expansion of its technology to serve the public. However, in scenario 4, the public awareness of net zero emission is still low, followed by their low willingness to use public transportation. In order to accelerate it, regulations such as incentives are given to public transportation providers in the form of public service obligations, so the price of using public transportation can get lower. The massive expansion in technology and low cost of using public transportation will likely raise public awareness and willingness toward net zero emission.

Scenario 5 is the ideal condition where the regulations match the needs of public transport, followed by the economic readiness owned by the public transportation with technological capabilities that reached the economies of scale by its massive expansion and high awareness and willingness of the public to use the public transportation. In this scenario, the regulation will likely adjust the needs of public transportation providers to implement net zero emissions while also giving incentives to keep the public willingness to use public transportation as high as possible. Regulation plays an important role since, without the support of regulators and political actors, it will be hard to implement net zero emission in public transportation, noting that each provider has different economic capabilities. Suppose the implementation is not reached together by all the public transportation providers in Jakarta; net zero emission will likely be implemented in those who are capable of economic factors, and the use of it will be low because the technology will still be expensive, affecting the public's awareness and willingness to use it.

- o Implication on Economic Readiness and Technological Capabilities of Public Transportation Providers

The economic capabilities of public transportation providers and their technological capabilities are related. Public transportation providers will not be able to research and develop the technology if they have insufficient economic capabilities. Therefore, instead of making it into separated parts, the author decided to group it into one section. Scenario 1 is a situation where the regulation and government action are not supportive of the implementation of net zero emission as it can be seen that the national target hasn't been targeted yet. In that situation, the public transportation providers are

not obliged to accelerate the implementation of net zero emissions. Private and mass public transportation providers have different economic capabilities. It makes them shift to the environment by their motives and carry out the financial burden by themselves to fulfill the technological capabilities while they don't have any clue about the things that need to be achieved.

Scenario 2 is a situation where the Government has aware of the needs of public transportation providers and imposes some regulation that matches their requirements. In this scenario, public transportation providers must know the target set out by the Government, which is obliged to implement net zero emission in their firm. The obligation of the regulation makes the public transportation providers have to prepare their economic readiness. Yet because private and mass public transportation providers have different economic capabilities, it may prolong the implementation of the net zero emission target by the Government. The implication of Scenario 2 can be seen from the enforcement of regulation to public transportation providers to have economic capabilities by raising their budget through farebox revenue, non-farebox revenue, and public service obligation. The insufficient economic may prolong their capabilities to research and development the right technology for their services.

Scenario 3 is a situation where the Government is aware of the needs of public transportation providers and imposes some regulation that matches their requirements. In addition, it is supported by the economic capabilities of public transportation providers to implement the regulation prevailed. Otherwise, in this scenario, public transportation has not found the right technology to be massively invested in accelerating the implementation of net zero emission in their firm. The economic readiness of public transportation positively affects the procurement of the right technology they need. The implication of scenario 3 can be seen from the budget that public transportation providers spend on research and development to find the right technology to accelerate the net zero emission implementation in their firm. In the future, with the increasing number of technologies used, such as EVs and renewable energy sources for their operational activities, the price of the technology will be lower and reach the point of economies of scale.

Scenario 4 is the output of what happened in scenario 3. With the condition where the Government is aware and supportive of the net zero emission program in public transportation and supported by the economic and technological aspects that public transportation providers have, the procurement of related technologies is invested massively and achieved economies of scale. However, one of the issues in scenario 4 is that the public transportation users are not yet aware and willing to use

public transportation that shifted to environmentally friendly. The implication of this scenario can be seen in the collaboration of the Government and public transportation providers to raise public awareness and willingness. It can be done by doing public service obligation to provide lower service prices, noting that service costs of EVs and shift to environmentally friendly technology are more expensive than the ICE vehicles and the non-environmentally friendly. In addition, the rise of the technology availability related to accelerating the implementation of net zero emission will also raise awareness and willingness to use.

Scenario 5 is the ideal situation where the Government is supportive, and Public Transportation Providers have the economic and technological capabilities, which affect the rise of public awareness and willingness towards the importance of using public transport to achieve net zero emission. The implication of scenario 5 can be seen due to the adjustments made by Government and Public Transportation Users to maintain public awareness and willingness to use public transportation as high as possible by innovating the technology they use from time to time.

- o Implications on Public Awareness and Willingness

The implications of scenarios 1-3 are very low because the procurement of related technology has not been carried out on a massive scale. For example, from interviews with several sources, the procurement of environmentally friendly transportation such as EVs on two-wheelers of ride-hailing and bus rapid transit has only been provided in the South Jakarta area with particular routes. In addition, the four-wheeler of ride-hailing is provided only with routes that start from Soekarno Hatta airport. Therefore, the limitation in implementing the kind of services mentioned before affects the public awareness of environmentally friendly technology in Jakarta is still relatively low.

Whereas in scenario 4, the stakeholders can already do environmentally friendly technologies such as EVs and the transition to renewable energy sources, considering they have the capabilities to shift massively to create scenario 5 where environmentally friendly technology can be known and felt by the wider community. In conclusion, the Government as a regulator has an essential role in encouraging shifting to net zero emissions by providing regulations that support and follow the needs of public transportation providers. Besides that, Public Transportation Providers have an important role in implementing the targets and regulations set by the Government with economic readiness to procure environmentally friendly technology. When these three things have been realized and run well, it will affect public awareness and willingness.

Noting that the transformative scenarios in this study are composed of several scenarios that need to be met

before reaching the ideal scenario, the stakeholders are divided into two: government and public transportation providers. Besides that, integrated payment providers also play an important role in supporting the scenario. While separated stakeholders into several groups, the key options are offered in each scenario to help them move from one scenario to another:

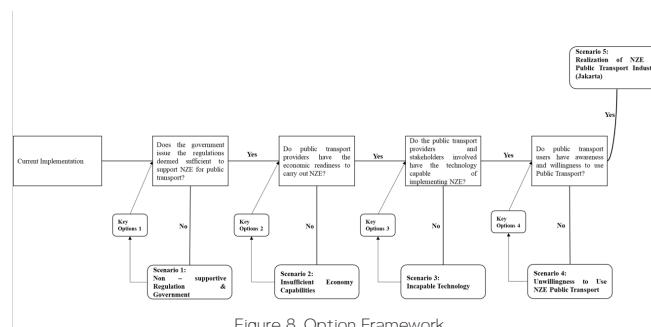


Figure 8. Option Framework

Key options 1 – 4 are needed to help the stakeholders transform from one scenario to another. In contrast, there is an additional key option to maintain the implementation of net zero emissions in the public transportation industry sustained in scenario 5. All these key options are the things that need to be done by stakeholders involved to keep on track to achieve and maintain the implementation of net zero emissions in scenario 5.

Stage 5 will describe the early warning signals that are needed to help all stakeholders execute the key options at the right time, which are mentioned in stage 4 above. However, the key options will work well if all stakeholders who play a role in each scenario have the desire and ability to transform from one scenario to another. Therefore, the early warning signals shown below will be conducted with a broader perspective noting that every scenario has different issues.

Table 3 - EARLY WARNING SIGNALS

Factor	Indicator	Early Warning Signals
Scenario 1: Gridlock and Pollution		
Presidency and Political Transition	Presidential and/or gubernatorial elections	Candidates who describe their program by ignoring environmental factors and the public transportation industry.
External Factors	International Pact	The implementation of government involvement in international pacts without preparing a roadmap to achieve the agreement's targets.
		Several public transport providers concerned about the international agreement are trying to implement it by creating their respective roadmaps.
Scenario 2: Stopping at Red Light		
Presidency and Political Transition	Presidential and/or gubernatorial elections	Candidates who explained their programs with concerns about environmental factors and the public transportation industry.
Regulation Factor	Supportive Regulation	The government and regulators invite public transportation providers to cooperate in creating regulations to support the acceleration of net zero emissions in public transportation providers.
	Regulation Enforcement	The government and regulators have set incentives for public transportation providers who wish to implement net zero emissions in their firms. The government and regulators have set penalties for public transportation providers who are reluctant to implement net zero emissions in their firms. The punishment has not yet been implemented.
External Factor	International Pact	The government's involvement in international pacts is supported by a roadmap to achieve the agreement's targets.
		Several public transport providers who have concerns about the international agreement are trying to implement it by using the government roadmap as a reference
Economic Condition	Economic Readiness	Several public transport providers with strong economic capacity are trying to implement it by bearing the financial risk alone.
		Some public transport providers who have weak economic capacity are trying to make plans to prepare their economic readiness.

Scenario 3: Green Light to Go		
Presidency and Political Transition	Presidential and/or gubernatorial elections	Candidates who explained their programs with concerns about environmental factors and the public transportation industry.
Regulation Factor	Supportive Regulation	The government and regulators invite public transportation providers to cooperate in creating regulations to support the acceleration of net zero emissions in public transportation providers.
	Regulation Enforcement	The government and regulators have set incentives for public transportation providers who wish to implement net zero emissions in their firms. The government and regulators have set penalties for public transportation providers who are reluctant to implement net zero emissions in their firms. The punishment has not yet been implemented.
External Factor	International Pact	The government's involvement in international pacts is supported by a roadmap to achieve the agreement's targets.
		Several public transport providers who have concerns about the international agreement are trying to implement it by using the government roadmap as a reference
Economic Condition	Economic Readiness	All public transportation providers have economic readiness that comes from the firm's financial capability and government support to implement and achieve the target set by the Government.
Technological Factor	Research and Development	Public Transportation providers started to conduct research and development related to environmentally friendly technology to accelerate the implementation of net zero emission in their firms.
Scenario 4: Getting There		
Presidency and Political Transition	Presidential and/or gubernatorial elections	Candidates who explained their programs with concerns about environmental factors and the public transportation industry.
Regulation Factor	Supportive Regulation	The government and regulators invite public transportation providers to cooperate in creating regulations to support the acceleration of net zero emissions in public transportation providers.
	Regulation Enforcement	The government and regulators have set incentives for public transportation providers who wish to implement net zero emissions in their firms. The government and regulators have set penalties for public transportation providers who are reluctant to implement net zero emissions in their firms. The punishment has not yet been implemented.
External Factor	International Pact	The government's involvement in international pacts is supported by a roadmap to achieve the agreement's targets.
		Several public transport providers who have concerns about the international agreement are trying to implement it by using the government roadmap as a reference
Economic Condition	Economic Readiness	All public transportation providers have economic readiness that comes from the firm's economic capability and government support to implement and achieve the target set by the Government.
Technological Factor	Research and Development	Public transportation providers have succeeded in finding suitable technology to accelerate the implementation of net zero emission in their firm
	Economics of Scale	The technology procurement cost becomes cheaper considering the widespread use of related technologies in the public transportation industry.
	Technological Procurement	Public transportation providers invest in related technology massively.
Socio-culture	Public awareness	Public awareness towards net zero emission and related technology already exists but is still relatively low.
	Public willingness	Public willingness to use public transportation already exists but is not yet at its maximum point Public willingness to contribute to the carbon offset on the use of ICE vehicles is still low
Scenario 5: Green and Connected		
Presidency and Political Transition	Presidential and/or gubernatorial elections	Candidates who explained their programs with concerns about environmental factors and the public transportation industry.
Regulation Factor	Supportive Regulation	The government and regulators invite public transportation providers to cooperate in creating regulations to support the acceleration of net zero emissions in public transportation providers.
	Regulation Enforcement	The government and regulators have set incentives for public transportation providers who wish to implement net zero emissions in their firms. The government and regulators have set penalties for public transportation providers who are reluctant to implement net zero emissions in their firms. The punishment has not yet been implemented.
External Factor	International Pact	The government's involvement in international pacts is supported by a roadmap to achieve the agreement's targets. Several public transport providers who have concerns about the international agreement are trying to implement it by using the government roadmap as a reference
Economic Condition	Economic Readiness	All public transportation providers have economic readiness that comes from the firm's financial capability and government support to implement and achieve the target set by the Government.
Technological Factor	Research and Development	Public transportation providers have succeeded in finding suitable technology to accelerate the implementation of net zero emission in their firm
	Economics of Scale	The technology procurement cost becomes cheaper considering the widespread use of related technologies in the public transportation industry.
	Technological Procurement	Public transportation providers invest in related technology massively.
Socio-culture	Public awareness	Public awareness of the net zero emission and related technology is already high
	Public willingness	Public willingness to use public transportation is already at its maximum point Public willingness to contribute to the carbon offset on high use of existing ICE vehicles (just in case the ICE vehicles are still in use, especially for the ride-hailing partners)

IV. DISCUSSION

The success of the precedent scenario determines the success of moving from one scenario to another. It means that every factor such as regulation, economics, technology, and socio-culture has an equally important role and is interconnected. In addition, the level of cooperation and desire of all stakeholders involved is the most important thing in achieving net zero emissions in the public transportation industry in Jakarta. If each stakeholder decides to go their separate ways without coordinating, it will likely prolong the shifting or even fail them to achieve net zero emission.

Noting that net zero emissions are new for developing countries such as Indonesia, an effort is needed to introduce and expand them to accelerate the program. One of the efforts that can be made is procuring electric vehicles for the public sector fleets. Reference [14] stated procuring electric vehicles for the public-sector fleets demonstrates leadership and has the potential to stimulate the early electric vehicle market through mechanisms such as increased model availability from industry, increased public awareness of electric vehicles, increased development of charging infrastructure, and stimulation of related businesses and expertise. Other than that, it can also be supported by the zero-energy building. Zero-energy building level in terms of operation is defined as a condition where the total amount of operational energy used by the building is compensated mainly by renewable energy generation on a typically annual basis [15].

V. CONCLUSION

In dealing with new conditions with high uncertainty, scenario planning is one of the appropriate methods. Scenario planning helps all stakeholders to capture the issue and determine what will happen from decisions taken in the future. Four factors are used as the basis for the formation of the scenario: regulation, economic, technological, and socio-cultural. Then, the sequence of factors that will be implemented is based on urgency and interconnection between each factor to achieve the ideal situation of implementing net zero emissions in Jakarta.

Each scenario in this study has different implications and early warning signals. Otherwise, it can be concluded that the Government and regulators play an essential role in this case. Without support from the Government and regulators, public transportation providers will experience difficulties because they must bear the burden of the economy, technology, and socio-cultural changes by themselves. Therefore, cooperation between stakeholders in the public transportation industry plays a significant role in achieving ideal conditions for implementing net

zero emissions in Jakarta.

In addition, the shifting to net-zero emission should happen in conjunction with public awareness and willingness to use environmentally-friendly public transportation. Decoupling the public mobility from emission will cause the effort to shift to net zero emission not to be achieved perfectly. Reference [16] stated by keeping car dependency intact, traffic volumes continue to increase, and it is therefore not surprising to see that emissions reductions from decoupling efforts, e.g., from vehicle electrification, have been ineffective in most countries. Behavioral changes of the public in using public transport is one of the critical keys, right after the government has provided the regulation with economic readiness and technological capabilities owned by the public transportation providers.

The managerial implications of this research are twofold. First, implementing net zero emissions may force the Government to provide regulations and incentives to bind and support the public transportation providers. It will encourage the public transportation providers to prepare their economic readiness, technological capabilities and raise public awareness also willingness to use public transportation, as seen in the interconnection analysis in figure 6 above. Second, the stakeholders involved in the public transportation businesses, or this case, the public transportation providers. The implementation of net zero emission will make them spend budget and do research and development for the technology related to net zero emission. Other than that, the public transportation providers need to cooperate with the Government to ensure that public transportation rates are stable and rising through the given incentives, along with maintaining its services and technologies.

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Paper 85

Planning and Implementation of Intelligent Transport System in DKI Jakarta Province

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Abstract - Intelligent Transportation System (ITS) is a transportation management solution using intelligence technology for integration between road networks, modes of transportation systems, and users. The implementation of ITS was started in 2010 in DKI Jakarta to overcome congestion problems. This system manages and uses data sources that are shared between various information management systems that integrate several tools, namely CCTV, Auto Traffic Control System (ATCS), and Camera Counting. Though the Government of DKI Jakarta has performed well in terms of planning and implementation, unfortunately, several problems are still hindering the success of ITS development, following planning and regulation basis, stakeholder cohesiveness, public awareness, and infrastructure development. A cohesive action should be taken in order to encourage participation from the whole stakeholders. A public campaign that encourages people to shift from private vehicles to public transport should be given priority to reduce the service burden on the highway and traffic congestion, at the same time increasing the return on public transportation investment.

Keywords - Intelligent Transport System, DKI Jakarta, public transport, advanced traffic management system, transport infrastructure.

I. INTRODUCTION

The fast growth of population and economic development in big cities in Indonesia enforce an increase in mobility which potentially causes traffic congestion problems. The growth of vehicles that is not matched by the growth of road infrastructure has the potential to cause an increase in the level of congestion. Traffic congestion is a chronic problem in Indonesian metropolitan cities such as DKI Jakarta and its surrounding area, namely Jabodetabek, resulting in significant economic losses caused by increased travel time, increased travel costs, and decreased environmental quality [1].

Rapid changes in the dynamics of people's lives in urban areas in DKI Jakarta encourage city managers to design a quick response and adaptive policy development. Transportation is one indicator of these dynamic changes [2]. The problem that arises is traffic jams that occur all the time and spread throughout the city. Public transportation is already available in various choices of transportation modes and is also growing more and more, but still cannot

reduce the level of congestion significantly [3].

An Intelligent Transportation System (ITS) is a transportation management solution that uses technology to integrate systems, applications, networks, and hardware based on intelligence technology for integration between modes of transportation systems. A study from ITS Indonesia estimates that the economic loss due to congestion in Jakarta will reach US\$ 6.5 billion or equivalent to Rp. 84.5 trillion by 2020, which increased 6.5 times compared to 2010. Currently, the average speed of vehicles in Jakarta during peak hours is only 10 km per hour. That rate has been decreasing every year for the past 10 years. Various efforts to deal with transportation problems have indeed been carried out by the government and business actors. However, the plans are still implemented in a silo way and sporadic so they cannot comprehensively overcome the challenges [4].

The application of ITS systems and models from developed countries is not easily adopted in developing countries [5]. For example, in Thailand, the success of ITS projects generally depends on collaboration between private, public, and government agencies in policy making and planning, coupled with inclusive agreements and knowledge of technology in the field [6]. From experience in Nigeria, the implementation of ITS requires the development of an evidence-based policy based on the specific context in the country, which is able to intuitively adapt to future traffic demands and inclusively improve transport efficiency and safety [7].

The Ministry of Transportation, Directorate General of Land Transportation, and Directorate of Urban Transport are encouraged to make Grand Design ITS in Indonesia. The preparation of the Grand Design is in line with the implementation of the Minister of Transportation Regulation No. 122 in 2018 concerning the Organization and Work Procedure of the Ministry of Transportation, which is expected to be a guideline for the application of integrated communication technology.

This study aims to obtain an overview of the application of ITS to infrastructure, facilities and transportation facilities in DKI Jakarta. The research question to be answered is to what extent the implementation of ITS in DKI Jakarta is based on the 11 main ITS system categories.

II. METHODOLOGY

This research discusses 11 main systems contained in the ITS Framework in Indonesia that have the potential to be implemented over the next ten years (2020-2030) see Table 1.

Table 1 - DESKRIPSI 11 SISTEM UTAMA PENGEMBANGAN ITS DI INDONESIA

Main Systems	Description
Advanced traffic management system	To improve traffic flow by providing real-time information integrated with traffic control center
Advanced road user information system	To provide real-time information on traffic conditions that affect the selection of optimal routes, modes and travel times
Advanced traffic safety and vehicle control system	To improve vehicle stability, driving safety and make travel safer & more efficient
Commercial vehicle operating system	To manage and provide maximum service, reduce route disruptions, travel delays, improve safety, and cost efficiency
Advanced public transport system	To improve the accessibility of information, the safety of public transport users, the efficiency of public transport and road infrastructure.
Electronic payment system	To provide convenience in payment services for consumers
Emergency management system	To facilitate coordination between traffic authorities in emergency situations
Advanced rural transport system	To improve the safety and efficiency of the mobility of people and goods in rural areas
Advanced travel demand management system	To limit travel requests using private vehicles by prioritizing the use of public transportation
Advanced parking management system	To ensure the safety and convenience of parking management
Autonomous Driving System	To improve the application of autonomous vehicle technology

From the 11 systems discussed, this study will exclude autonomous driving systems because currently there has been no clear framework for the implementation yet.

The research was conducted by literature review, e.g. working papers from ITS Indonesia and relevant research papers; and interviews with relevant stakeholders who have roles as regulators, operators, and consumers, e.g. Dinas Perhubungan (Dishub) DKI Jakarta, Jaklingko, and Jakarta Smart City.

III. RESULTS AND DISCUSSION

Munawar and Sutanta [8] evaluated the application of IT in several cities in Indonesia, namely Jakarta, Bandung, Surabaya, Yogyakarta, Solo, and Denpasar. ITS applications in these cities that have been identified include Area Traffic Control System (ATCS), traffic infrastructure, travel information, public transportation service systems and commercial vehicles, traffic information, and electronic ticket systems. The problems encountered are related to financial support and human resources. Several things are also suggested to be taken into consideration in developing an ITS system, namely sustainability, open system, user-friendliness, vendor support, reliability, investment feasibility, and a high level of domestic components. Meanwhile, Pindarwati and Wijayanto [9] conducted a comparative study in 5 major cities in Indonesia by searching web pages and data from local governments to measure 60 indicators of smart transportation system performance. They stated that this benchmark value might change over time due to the emergence of new technologies that can create new dimensions for the developing urban transportation system.

Putra et al. [10] proposed four aspects of supervision such as traffic control, vehicle supervision, passenger supervision and driver supervision which will produce an applied ITS called Smart Transportation Systems (STS). Sriratnasari et al. [11] conducted a study on how to manage DKI Jakarta's transportation system and how to integrate it into a comprehensive smart city transportation system. A new architecture was developed to integrate smart transportation using the internet of things (IoT).

Susanty et al. [12] investigated the fundamental barriers that made the development of the ITS project in Semarang and concluded that there are three significant obstacles, namely the low interoperability of the system making it difficult to integrate an ITS-based transportation system, the lack of involvement of relevant agencies to build long-term commitment and awareness of the benefits of the ITS project, and political problems (short-term thinking or discontinuity due to political cycles). In line with these findings, Yusuf et al. [13] show the weak coordination between stakeholders and the absence of legal rules governing the implementation of ITS are still obstacles.

Although the application of ITS technology in Indonesia is not yet at the same level as in developed countries, many have shown the potential to reduce congestion, energy use, and pollution. However, there are still many obstacles and challenges that need to be overcome and anticipated in the various applications of ITS in Indonesia. In addition, the impact of ITS on the behavior of transportation users, economic benefits, and environmental impacts have not

been studied much. This study is expected to contribute to providing a broader and deeper understanding for stakeholders in the transportation sector, especially the organizers and users of the intelligent transportation system (ITS) and policymakers.

Some of the implementations have already been realized and some are still in progress. In Indonesia, the development of ITS was initiated in Jakarta since 2010 under the Traffic Control System Management Unit (Unit Pengelola Sistem Pengendalian Lalu Lintas) DKI Jakarta in collaboration with the DKI Jakarta Provincial Government, City Transportation Council, and PT. Transjakarta. This system manages and uses data sources that are shared between various information management systems that integrate several tools, namely CCTV, Auto Traffic Control System (ATCS) and Camera Counting. Through this system, the government hopes that transportation as a whole can work effectively and efficiently as a responsive system for a solution to congestion in Jakarta. Moreover, the implementation of this system should be accompanied by education to the public to increase public awareness.

According to the interview conducted with the Dishub DKI Jakarta, the planning and implementation of the intelligent transport system are managed by the Unit of Traffic Control Management which was established in 2010. We find that there are six strategies for improving and developing ITS. In order to meet the improvement and development of ITS in DKI Jakarta, there are six strategies for improvement and development, namely:

a. Traffic Control Management, consisting of:

- o Improvement and development of ITS Traffic Light through ATCS integration from monitoring so that it can become an actuated vehicle.
- o Improved SPLL Dishub DKI command center control system by adding a dashboard interaction feature that is useful not only for providing traffic data but including monitoring, evaluation, and real-time data such as incident management systems through surveillance systems.
- o Addition and improvement of VMS (Video management system)
- o Added several interactive applications that support ITS Traffic light such as engine interactive command center applications, engine applications for proactive community communication services, mobile applications for mapping the DKI Transportation Agency traffic lanes along with map licenses, vehicle data verification system applications, and video management system applications (VMS)

- o Development of Green Wave Technology for public transportation, official vehicles, and emergency vehicles.
- b. Public Transportation Service Improvement, consisting of:
 - o Tap in/tap out technology development
 - o Development of information technology for arrival schedules, routes, to the availability of places in public transportation in real-time
 - o Development of public transport security technology with CCTV
- c. Traffic Safety and Incident Management, consisting of:
 - o Development of accident detection technology through CCTV
 - o Development of traffic accident/incident reporting technology
 - o Development of speed-limiting technology
- d. Electronic Payment (Electronic Payment)
 - o Development of Smart Card technology
 - o Development of Near Field Communication (NFC) technology
 - o Quick Response Code (QR Code) technology development
- e. Travel Information System (Traveller Information System)
 - o Travel navigation application development
 - o Development of variable message sign (VMS)
 - o Development of travel navigation
- f. Goods Transport Operations Management (Commercial Vehicle Operation Management)
 - o Development of walking weighbridge technology (weight in motion)

Currently, to comply with the advanced traffic management system, the Dishub DKI Jakarta has already installed 18 Traffic Counting Sensors, 167 Fix CCTV, 81 pan-tilt-zoom (PTZ) CCTV, 166 Traffic Light with ATCS, and 16 Speakers and Variable Message System (VMS). These systems are connected to the control room which can be managed automatically or manually by looking at the circumstances.

From the aspect of the integrated payment system, in collaboration with Jaklingko, the government continues

to strive to provide a convenient payment system and continues to reduce tariffs so that private vehicle users will switch to public vehicles. One of them is by providing appropriate subsidies to several groups of users of public transportation, such as students, senior citizens, disabled, and low-income groups. Currently, a payment card transition is being carried out from chip-based to server-based so that the provision of subsidies is more targeted and the need for service improvement is being carried out.

In the smart parking system, we can see that the DKI Jakarta Transportation Agency has installed parking equipment on several main roads. In addition, parking officers with mobile parking devices are also alerted in an effort to control and provide easy parking payments.

The implementation of Electronic Road Pricing (ERP) in several special areas in DKI Jakarta is also one of the cross-subsidy schemes being prepared by the Dinas Perhubungan DKI Jakarta. The allocation of ERP will help the government to fund public transportation development, increase connectivity, and protect the environment. Research by Sunitiyoso et al. asserts that the respondents who are road users in DKI Jakarta have positive responses to the ERP plan [14]. Currently, the ERP scheme is still in the stage of drafting local regulations (Peraturan Daerah) as a legal basis for collecting funds from the community.

V. CONCLUSION

ITS planning and implementation in Jakarta have been on a clear roadmap with strong support from relevant stakeholders and adequate funding. Although the COVID-19 pandemic had an impact on the acceleration of ITS development, it is now back in the initial planning with the aim of increasing the movement of private transportation users to public transportation.

The development of communication infrastructure, such as fiber optic networks, is one of the important keys to the distribution of ITS applications [11] in all areas in DKI Jakarta. Data transfer using a wireless network is still considered as an obstacle to ITS infrastructure development in the suburbs of DKI Jakarta.

From the institutional side, the collaboration between institutions, including the provincial government, central government and operators, has been going well in planning integration [13]. However, in terms of funding, more robust coordination is needed to ensure the sustainability of the transportation system after the deployment phase ends.

From the government and operator side, we can see that human resource development is a very important aspect of always being adaptive and responsive to the

adoption of new technologies used [15]. Capacity-building training should be periodically held in order to guarantee compliance with the objectives [7].

Various transportation technology infrastructure developments have emphasized the importance of using national resources, including local programmers to deploy and facilitate maintenance processes and improvements for future needs. Nevertheless, systems applicability and reliability should be considered when it comes to practice. Mfenjou proposed four major modules to increase ITS reliability, following autonomous management of control points, detection and diffusion of disturbances, dynamic route planning, and autonomous decision support [16]. Also, the government and operators should prepare a module in security and privacy issues [17].

The active role of the community is needed in helping the government improve the quality of development and maximum transportation services [13]. Currently, there is a city transportation council consisting of various stakeholders, including the public transportation user community, government, operator practitioners, and academics. The City Transportation Council has been actively involved in regular discussions discussing efforts to improve development and transportation services in DKI Jakarta [7-8].

This research is still considered a preliminary study which will be followed by further interviews and focus group discussions.

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Paper 86

Improving Acceptance Of Iposyandu Application In
Community Health Workers: Service Science Perspective

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Abstract - Maternal and Child health data report by Community health workers (CHW) is still using paper manually. Consequently, it creates delays in policymaking and implementation. Therefore, the iPosyandu application as developed presenting as a digital health platform in helping CHW store the data online. Despite the benefits of iPosyandu, CHW is still reluctant to use this application. Hence, this study aims to analyze the strategies that can be used to improve the acceptance of the iPosyandu in CHW based on a service science perspective. Service science of value co-creation was chosen as a strategy to create a model of CHW acceptance. By conducting focus group discussions, this study engages the participation of CHW and other relevant stakeholders to explore and develop the strategic processes. The result found the need for government policy support for digitalization in CHW and develop the platform, both in platform regulations and application readiness. After all, digitization in CHW can make stakeholders easier to monitor and more responsive to formulate health policies.

Keywords - Community health worker (CHW), iPosyandu, Service Science, Digitalization

I. INTRODUCTION

The Ministry of Health of the Republic of Indonesia defines Primary health care (PHC), known as Puskesmas, is a health service facility that prioritizes preventive and promotive efforts to achieve a high degree of public health and provide public and individual health services [1]. According to the Alma Ata Declaration, written on the Sustainable Development Goals (SDGs) PHC is essential in optimizing population health outcomes [2]. However, health workers (HW) like doctors, nurses, midwives, and nutritionists in PHC cannot be able to complete this goal by themselves. Therefore, HW collaborates with Community health workers (CHW) to improve and maintain the health of communities in their environment.

CHW has the job of carrying out health management and services at the Pos Pelayanan Terpadu (Posyandu), a place for health services managed directly by the CHW. HW directly supervises the implementation and reporting of this activity from the PHC. Unfortunately, their report from Posyandu is still delayed, especially in reporting and accessing information[3]. Consequently, it created decision-making and policymaking in health service delays

[4]. Therefore, the iPosyandu application, a Mobile Health application (mHealth apps) platform, was created to fill this gap by helping CHW easier and faster collect and report the Posyandu data. However, the use of iPosyandu has not been fully accepted by CHW[5].

There are unique challenges when CHW transforms to adopt digital technology in health service, such as an issue with internet connectivity, management costs, poor sustainability of the pilot project, week of technical support, including challenges related to management[6]. Previous research suggests finding strategies to improve CHW adoption of mHealth apps in low and middle-income countries [7]. Service, better known as Service science, management, engineering, and design (SSMED) is one of the ways to find strategies to improve adoption in CHW. Service Science (SS) can be integrated in various fields of science, including being used to solve management and technology problems[8]. Although most service science concepts are widely used in business strategy, SS can be used in fields such as mapping, social and disaster management[9]. Therefore, this study aims to analyze the strategies that can be used to increase the acceptance of the iPosyandu application at CHW based on a service science perspective.

Acceptance iPosyandu in Community health worker

Acceptance of technology is the user's willingness to employ technology for tasks designed to support them [10]. Technology acceptance itself is often associated with technology acceptance theory, such as the Technology acceptance model (TAM)[11] and the Unified Theory of Acceptance and Use of Technology (UTAUT) [12]. However, the test results from the examined model theory had different results in any study depending on the region's conditions and characteristics [13]. Therefore, a deeper study is needed to find strategies to increase technology acceptance because analysis using the quantitative method to test the acceptance of iPosyandu cannot describe the acceptance more profound.

Technology acceptance among CHW was still relatively reluctant to use[14]. Hence, exploring the strategy to solve it was needed because Community Health Workers (CHW) have an essential role. Community Health Workers (CHW) or Cadre is a community whose members come from the community to serve community health

care on the frontline[15]. They give the service to the people who can be underserved and generally from the communities themselves. CHW is essential in maintaining the community's health in their environment. One of CHW's tasks is to participate in providing health services for mothers, children and even the elderly at the Posyandu. To optimize CHW's performance, they need technology support, one of them using a mobile health (mHealth) application.

mHealth itself has been widely applied globally and provides many benefits. Earlier research conducted in Pakistan, show the use of mHealth by CHW can benefit the community by improving illness management in children[16]. mHealth also can support CHWs in Uganda, Mexico, Liberia, and Ghana, to tackle COVID-19[17]. The study in Kenya, mHealth can be used by CHW to screen residents' cardiovascular risk[18]. In Indonesia, mHealth can speed up and make it easier for CHWs to input and report data [5]. In India, the use of mHealth can make CHW more confident in dealing with pregnant women with preeclampsia so that the interaction between pregnant women and CHW increases[14].

The innovation presented by the mobile Health service platform (mHealth) in Pasawahan district, Indonesia, was iPosyandu (Figure 1) this application was created to assist CHW in inputting, reporting and monitoring maternal and child health, either from the results of Posyandu activities or home visits. Other functions of iPosyandu include; allowing access to data previously done manually in the book. As a reminder for both CHW, midwives and parents regarding the Posyandu schedule, as a means of CHW education, it is possible as a community diary, and the data is only personal for everyone who does the examination, clinical family health history, service scheduling can be done via cellphone.



Figure 1. iPosyandu Platfrom

The data inputted by CHW is integrated with iPosyandu for parents and can be viewed by PHC and the government (Figure 2). Then, parents and CHW can routinely monitor and evaluate Posyandu data, such as the results of weight, height or immunization status. This monitoring is carried out directly by health workers (midwives and nutritionists) who work in PHC. If health care problems are related, it will be easier for health workers to provide intervention because tracking can be done more easily and quickly. Also, the list of toddlers recorded by the cadres will be used by the midwife to prepare the number of vitamin A capsules to be given and can even monitor whether the appropriate immunizations have been given. However, there are still cadres whose acceptance in the use of the mHealth/platform is not maximized[5]



Figure 2. iPosyandu data integration

(kompasiana.com, 2022)

Several obstacles prevent CHW from using mHealth, such as lack of training, weak technical support, issues of internet connection, and other administrative and management challenges[7]. Then, this application has not been used in all CHW, it can be seen from the number of applications only used in certain areas. Therefore, there is a need for strategic management in overcoming this problem, considering that it will provide great benefits if implemented optimally.

Service Science

Service-Dominant Logic (SD-Logic) an important theoretical framework in developing the concept of service science[19]. This concept is different from the traditional concept, which approaches service and exchange. Service science itself can be defined as a transdisciplinary systems approach to learning, scaling, creating, improving, and innovating service delivery by interaction[20]. In this study, we define service science as value co-creation, as the beneficial change from the results of planning, communication, or knowledge interaction between different service system entities, such as individuals, institutions, technology, organizations and nations, where these form a service Systems [21].

The concept of value co-creation reflects that value is

not created exclusively by an individual or group [22]. Each actor in the interaction has a different value[23]. Consumers/users have an important role in shaping a company's value. These values are expected to create a customer and make the company able to continue to run and survive in any condition or situation.

The participation of customers or users in co-creation can be formed in 2 ways: customers can contribute by sharing their views with the company (indirectly), or they can be directly involved (directly) in the value creation process[24]. The value co-creation has two layers (Figure 3) This layer shows the value co-creation process and the interaction between customers and providers to "get on board" to create shared values and mutually control, called the value orchestration platform[25].

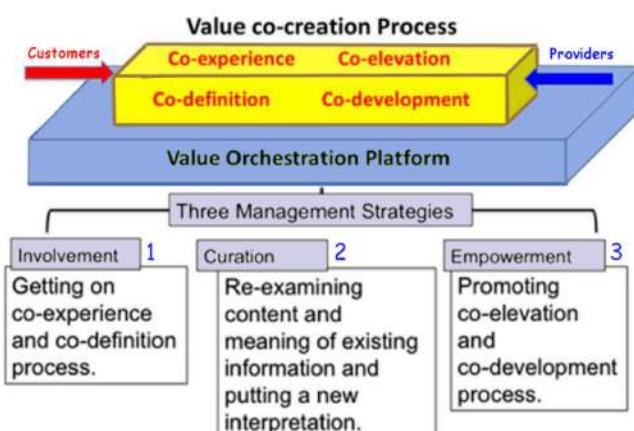


Figure 3. The 2-layer concept of the management strategy of value orchestration

(Adapted from Kijima&Arai, 2016)

This platform will be successful if two parties participate. Many services are provided using a two-sided platform, especially the Internet like iPosyandu. This process also explains that customers/users can evaluate and assess the value, and providers learn from user responses. Value orchestration platform facilities and new value co-creation made by providers and customers are divided into four co-phases, while the orchestration strategy is divided into three phases. [25], namely:

1. Involvement Strategy

The strategy is to invite consumers and providers to share experiences (co-experience) and understand each other (co-definition) about the service or product produced together.

2. Curation strategy

Strategies how to interpret/package new services/products produced by re-examining the content and meaning of the existing information to be sustained.

3. Empowerment Strategy

This strategy aims to promote co-elevation and co-

development (assessment from consumers and learning providers to respond)

For the matrix strategy in value orchestration, the co-experience and co-definition phases are only in the involvement strategy phase [9], in social communities, the second and third strategies are crucial. Therefore, researchers try to develop curation and empowerment strategies using the iPosyandu context.

II. METHODOLOGY

This study uses a qualitative method which is a process to capture reality to understand a social, cultural and other phenomenon [26], with an abductive approach. The data used are primary and secondary data. Primary data is obtained from FGD results, and secondary data is obtained from developer data of the list data that CHW has input. This research conducts the primary data with focus group discussion (FGD). The FGD was conducted to explore gro information regarding the interaction and value creation process at CHW, based on the perspective of CHW as a customer and Health worker as a provider.

Based on the value co-creation process, stakeholders sit together to share their internal model and find out their needs and capability. The FGD data was collected from 12 CHW from each village, village midwife, nutritionist, and midwife coordinator carried out on April 14, 2022 in Pasawahan sub-district, West Java, Indonesia. The questions given refer to service science in previous research [27][28]. They discussed each other's complaints, expectations, and desires in this discussion. Before the FGD, researcher asked for a signature on the list provided, which stated that FGD members were willing to participate in this activity and were informed about the importance of holding this activity.

The researcher recorded it via cellphone video and audio recording during the discussion process, which the participants had previously approved. Furthermore, the coding and grouping process is carried out using content analysis techniques with NVivo Seal software. After the code is obtained, the analysis is conducted based on service science. The FGD ware used the Indonesian language, so the researcher changed it into English after analyzing this article. The code uses thematic for analyzing qualitative data, which entails searching across a data set to identify, analyze, and report repeated patterns.

Based on the FGD results, it can be described that CHW has problems related to the ease-of-use iPosyandu when operating the application. Second, the application lacks efficiency because it has not integrated with another application. Third the lack of involvement of the government's role in the operation of iPosyandu. Then it

will make innovation development more difficult because there is no obligation to use and a sense of ownership. This FGD resulted in a solution to advocate for local governments to support CHW in using applications. Based on the deal of all participants, they agree to use the iPosyandu application if a platform is developed and has government policy support.

In addition to FGDs, field observations were carried out to see the value co-creation process and interaction between CHW and health workers in the field to solve the problem and the resolution together. In addition, a survey was also conducted on iPosyandu users by distributing questionnaire.

III. RESULTS

iPosyandu is a digital health platform used in the Posyandu research area. Many other Posyandu applications can be used, but they are still regional, and their sustainability is unknown. iPosyandu and other Posyandu applications can be viewed and downloaded (<https://play.google.com/store/search?q=posyandu>) On the play-store, the lack of reviews given regarding the application. This shows obstacles in the first to the second phase in creating new values of iPosyandu. Therefore, there is a need for a strategy that can make the iPosyandu application continue can be used by all CHW in Indonesia.

Secondary data obtained from iPosyandu developers found that those who fill iPosyandu are CHW that have received training, the government has been invited to collaborate by developers, and Posyandu cooperates with the private company (Astra) that oversees this application. The FGD results found that the government's role in providing health policies was crucial. One CHW said, "I am not required to use the iPosyandu, so I do not want to use the application unless there is any research come, or there is a certain moment when I have to use it." This statement is one of the reasons why CHW do not use the application because they need someone to tell them to use it. Then, creating a new value was a need

The researcher analyzed the result of FGD compiled using a two-layer service science strategy to understand what providers and customers expect about what they want and need. Service is co-creation among entities in a service system. The service provided by iPosyandu is to facilitate communication between CHW and health workers in reports on the implementation of Posyandu activities.

Based on the discussion, to see CHW perception of the current platform, a questionnaire was made using the Likert scale and involved 35 random respondents. Based on thematic analysis, the writers identified five important

issues of the use iPosyandu (Figure 4). The following is a ranking of issues regarding the iPosyandu feature, which can be seen in the following image

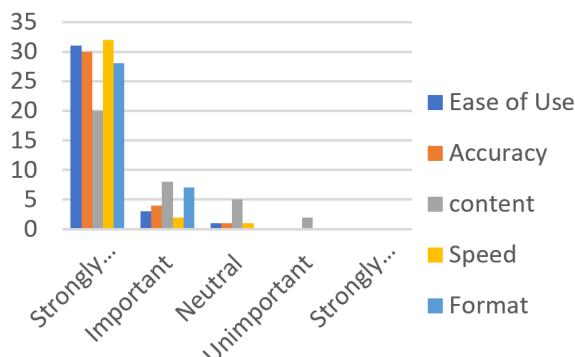


Figure 4. Result of Questioner

In distributing the questionnaires and the results of the FGD, which was the highest speed, CHW suggested that the server be updated so that the data input process was faster. The second is easy to use, so the design format must be as simple as possible. The three applications must have high accuracy, the data entered and viewed is correct, and the information provided is interesting. The four formats in the application are made as simple as possible to avoid repeated input and are more comfortable to see. The last is content, which includes completeness of content and information

IV. DISCUSSION

The results of FGD show have required management by the government in managing and developing information, where the orchestration is an institution outside the government. Currently, the government's activities are only limited to receiving data and giving permission to use applications without being directly and continuously involved in developing iPosyandu.

The iPosyandu platform needs to be developed according to the needs of each stakeholder involved in Posyandu activities. In other words, this platform is expected to be a forum for all stakeholders to develop innovation. In the proposed platform, there are three management strategies of value co-creation and four value orchestration processes, following

Value co-creation process in Community health workers

1. Co- experience and co-definition

Sometimes customers and providers do not know their expectations and capabilities. The co-experience phase seeks to reduce this gap regarding seeds and needs.

Consumers and providers share their internal models related to service, and an understanding occurs, so customers understand the direction and the provider understands customer preferences and needs in service. It called co-definition.

In this process, CHW and health workers need to know how to use the application and what data needs to be inputted. They need to have an experience after using iPosyandu. For example, CHW and midwives discussed after using iPosyandu the completeness of the data, lists of mothers, infants and toddlers, and what obstacles were encountered in collecting data. Co-experience was an agreement between the CHW and midwife on how satisfied and easy the iPosyandu with co-experience and co-definition in collecting the data.

2. Co- elevation process

Co-elevation is a reciprocally led process by the provider and customer in the system. Therefore, there is a zig-zag process between user expectation and provider availability. The high level of service will increase the expectations of the user. In this process, the health worker conducts training and evaluates the inputted data using iPosyandu.

3. Co- development process

The co-development process pays more attention to co-innovation, which results from simultaneous collaboration from various entities, namely customers and providers. At this stage, customers evaluate the value of the providers' learning outcomes from their responses. Besides that, collaboration needs to be carried out at this stage. For example, at this stage, the provider and user try to give direct input to developers regarding the ease of use of the application or advocate with the local government.

Value orchestration

The value orchestration phase tries to make customers and providers "get on board" to interact and facilitates customers and providers to hold the process and control. Facilitating the co-creation process requires value orchestration to find strategies to increase the use of the iPosyandu application.

1. Involvement strategy

Involvement strategy is how to create customers and providers "on board" with the platform and vitalize interactions between them. This strategy attracts and involves customers and providers to maximize the profit order is crucial. A cycle of Sympathize, Identify, Participate, and Share and Spread (SIPS) is used to identify how customers and providers are interested in the platform. In general, how they are interested in iPosyandu. This strategy shows that CHW requires an integrated platform

and is easier than government applications. This study needs to experience using the iPosyandu application to them, including giving the CHW promotion and training.

In addition to CHW at this stage, it also applies to providers because the provider's intentions are reduced because they feel that the iPosyandu filled by CHW does not help optimally. After all, it is not integrated with government applications. Then, they still have to transfer data to government applications as reports, so they feel less efficient

2. Curation Strategy

Curation strategy can be defined as a highly proactive and selective value co-creation in collecting, analyzing, selecting, and reviewing the meaning of services and information to create a new meaning for them. This strategy is mainly used to challenge customers and providers to co-elevate and co-develop.

The FGD results also showed that this strategy could be developed using co-experience and co-definition processes. For example, CHW argues:

"There are so many applications it makes me confusing, and included e-ppgbm owned by the government, so we add more work. Why is there no data integration, so we can choose which one to use?. Because e-ppgbm had a follow-up by the government, we have referred still used manual recording first because more simple. If there is an evaluation about iPosyandu, we will convey the same thing because our complaint is not realized to have integrated application".

Based on this statement, we can see that their experience will increase and give new meaning if the government provides a policy on using applications. The perceived policy support was needed to have resource integration and beneficiary of the exchange (Figure 5) Without a policy, this strategy cannot work. In the future, the value orchestration strategy can be focused on this stage first because it is still not working in CHW.

3. Empowerment

Theories that exist specifically other aspects of empowerment are co-elevation and co-development. Especially how active customers and providers have the same motivation to interact together. Using the cycle of SIPS, we can see how to increase application acceptance using co-experience and co-definition processes. There is a CHW that says:

"At the time of the competition, I thought only the books I saw were judged. If I knew, I would use them to get additional points."

The health worker gave his statement:

"There is no follow-up from the government to us, so whether to use it or not has no effect. So I cannot force them to use iPosyandu."

From these, interactions that can be strengthened will occur if both parties are given clear rules and regulations from the government, especially if they get an award, which will make them even more excited.

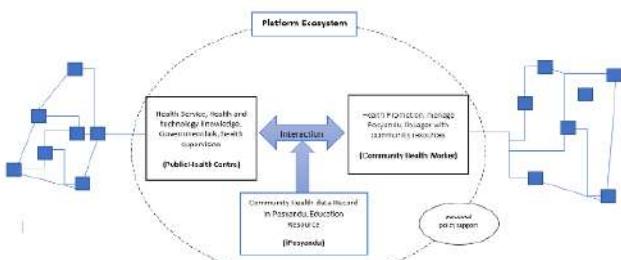


Figure 5. Incorporating the service system

Referring to current internet trends, the mobile application supporting their duty is the best. Health applications containing government programs' data are required to provide data on their activities, where health workers who act as providers carry out routine reporting to the government. The government report application, namely Pencatatan dan pelaporan Gizi berbasis masyarakat (e-PPGBM) application for data on maternal and infant nutrition and e-Kohrt (data on the development of pregnant women). The advantage of this application is that iPosyandu has loaded all the data in e-ppgbm and e-kohrt. The weakness of iPosyandu is that there is no integration between iPosyandu and government applications. If the iPosyandu has been integrated and fixes important issues in the use of the application, the iPosyandu will be able to be used even though no policy regulates it. There need to be clear regulations so that it can meet the expectations of all stakeholders, such as cadres it is easier and faster to report, midwives can more quickly and easily monitor CHW and report to the government, and finally, the government gets faster and more accurate public health data. The next development is the platform itself.

The platform innovation model that needs to be developed is divided into two: backstage and frontstage. Backstage is an application with data developers owned by each division, and frontstage is an application that interacts directly with CHW. In the iPosyandu application, each menu is developed to improve Posyandu activities. In the dashboard menu (Figure 6) there is an accumulation of the number of children, pregnant women and women of childbearing age and a graph of the number of visits. This menu provides automatic data accumulation from the amount of data for toddlers and pregnant women.

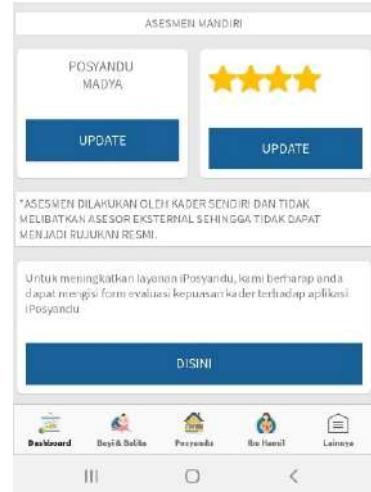


Figure 6. Dashboard of application

Figure 7. It Shows data on infants, toddlers and pregnant women, where the results of examinations at the Posyandu are included in this data. It would be better if this data were integrated with each CHW account who work in the same Posyandu. Also, the data entered can be integrated directly with government applications.

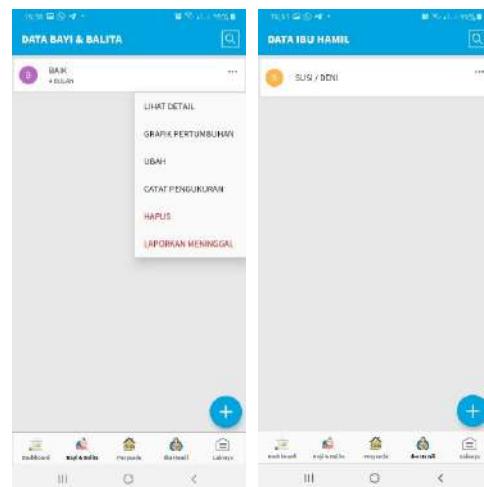


Figure 7. Form to input and list of pregnant women and children's data

Figure 8 shows the calendar and surveillance of the Posyandu implementation, this Posyandu data is better if it is connected to the Iposyandu application for parents and midwives.



Figure 6. Dashboard of application

Figure 9. contains Health education videos for CHW which will be more accurate in providing education. In addition, menus fill in data on couples and women of childbearing age, Pasangan Usia Subur (PUS) or fertile age couple and Wanita Usia Subur (WUS) or women of childbearing age which contain data on contraceptive acceptors. There is also a draft report which is usually filled out manually. Account settings and help menu which also contains what's app number if there are problems. This application is complete enough to provide education, but the position of the list of women of childbearing age is separate and there can be one menu option to enter data such as a list of pregnant and toddlers.



Figure 9. option menu on the application

V. CONCLUSION

The value co-creation process and value orchestration platform were offered in this work among CHW. We used iPosyandu as the platform for customers (CHW) and providers (Health Workers) to communicate with each other. We anticipate that the mobile app will serve as a helpful platform for customers and suppliers to communicate. As a result, there are a variety of inputs for developing innovations, such as connecting with government apps and reviewing existing features.

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Paper 87

Driving Factors of Entrepreneurs to Do Business in the Metaverse: A Conceptual Research

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ICMEM

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Abstract - The Metaverse gains more and more attention each day. The development of the Metaverse requires entrepreneurs to grow their business capabilities and the willingness to do business in the Metaverse. However, the Metaverse remains a mystery for many due to its contemporary nature. Thus far, those developing businesses in the Metaverse are limited to the early adopters. In that regard, this research aims to contribute to the literature on the Metaverse by investigating factors that drive entrepreneurs to do business in the Metaverse. The current state of the literature provides very limited empirical insight regarding the Metaverse. This research utilizes an extensive literature review method, particularly in entrepreneurship literature in a virtual world setting (e.g., Second Life), to obtain relevant insight on the subject matter. The literature regarding the previous trend of the virtual world can act as a proxy to gauge the Metaverse due to their similar characteristics. Furthermore, this conceptual study is projected to produce a new proposed model that comprises factors that drive the entrepreneurial intention to do business in the Metaverse.

Keywords - Artificial intelligence, business intention entrepreneurship, metaverse, virtual world

I. INTRODUCTION

The term 'Metaverse' has seen a significant rise in popularity after Mark Zuckerberg's announcement on October 28th, 2021. He rebranded his company, Facebook, by changing its name to 'Meta' [1]. The transition was made to reshape the company's identity to give a proper representation for its future key product: The Metaverse [2]. Zuckerberg is not, by any means, the only prospector eyeing business in the Metaverse. Tech giants such as Microsoft, Nvidia, Google, Qualcomm, and many others have invested billions of dollars into developing their version of the Metaverse [3]. Even big players in the fashion industry take a keen interest in the Metaverse. For instance, GUCCI, Balenciaga, and Louis Vuitton joined the Metaverse initiative [4]. In a recent report done by McKinsey, it is estimated that the value of the Metaverse could inflate up to a staggering \$5 trillion by 2030 [4].

The term 'Metaverse' was first coined by Neal Stephenson in 1992 in a Novel titled "Snow Crash" [5]. In the book, The Metaverse refers to a virtual world in which people can interact with others and engage in various activities in the

form of a digital representation called an avatar. In our world, the word Metaverse is yet to have a definitive definition [4]. Despite the term's ambiguity, there appears to be agreement that the Metaverse is the next iteration of the internet. It is predicted to offer an immersive experience that further blurs the line between virtual and reality [5]. With the support of blockchain technology, the Metaverse allows a system that operates in a decentralized manner that, in turn, gives more agency to users to dictate their own business and economy. This quality is hailed by many as the key to the Metaverse's limitless potential.

In the present day, the idealized vision of the Metaverse has yet to be realized. For example, there is yet to exist an interconnected and persistent virtual world in which we could immerse ourselves with the support of Augmented Reality (AR) and Virtual Reality (VR) technology. Nevertheless, the building blocks, such as Cryptocurrencies and the Non-Fungible-Token (NFT) rapidly develop while their usage permeates society more daily. For instance, one of the prominent Cryptocurrencies, Bitcoin, debuted on New York Stock Exchange 13 years after its inception [6]. Meanwhile, NFT saw a massive increase in trading volume estimated to surpass 24 billion dollars in 2021 compared to only 0.1 billion dollars the year prior [7]. In terms of infrastructure, AR and VR technology are expected to increase in value up to ninefold by 2025 [8]. It is as if the world is making a serious preparation for the inevitable future of the Metaverse. However, there are lingering questions surrounding the trend; will the public, low to mid-range business practitioners and laypeople, join the Metaverse bandwagon? or the Metaverse enthusiasm is exclusive to those tech giants and capital holders?

Despite the Metaverse lucrative potential, considerable uncertainty looms over its adoption. For instance, most developing countries lack the technology to support the Metaverse. According to the assessment by [9], the entry-level VR (8K, 2D, 30fps) needs to be supported by a minimum of 100 Mbps internet bandwidth, while the advanced VR (12K, 2D, 60fps) requires 400 Mbps internet bandwidth. Currently, no country has the required internet capacity for advanced VR. Even the entry-level 48 countries can only support VR (according to nations' internet bandwidth data from [10], most of which are developed countries. The rest, especially third-world countries, are left out with internet bandwidth ranging from 30 Mbps and below (Indonesia, for instance, currently has 27.83 Mbps internet bandwidth).

Furthermore, technology literacy may also affect the desire to join the Metaverse. According to the Microsoft Work Trend Index Annual Report, around 52% of the respondents are open to using immersive digital space in the Metaverse. Among those who are enthusiastic are Gen Z and Millennials [11]. However, a survey by [12] that measures the Indonesian younger generation's social media habits shows that only 29% of the respondents are familiar with the Metaverse. 87% of the respondents are those between 18 and 35 years old, which is on the younger side. These habits can indicate a disparity between the brewing hype of the Metaverse and the actual global interest.

In that regard, it remains unclear whether the interest in jumping into the Metaverse is prevalent in society. Research regarding the intention towards the Metaverse (read: [13]–[17]) is already being done. However, it is limited to the general intention of using the Metaverse [14], [16], [17] or specifically adopting related technology [15]. Meanwhile, research regarding the intention to develop business in the Metaverse is under-explored. Considering that opportunities and the various new form of consumption are among many of the Metaverse attractiveness, the need to find the driving factor for entrepreneurs to do business in the Metaverse becomes urgent. Therefore, this study aims to determine the driving factors for entrepreneurs to do business in the Metaverse. In doing so, this study is initiated by two research questions as follows:

1. What is the Metaverse?
2. What are the driving factors of entrepreneurial intention to do business in the Metaverse?

Tackling the first question, this research will do comprehensive research on the literature, both sourced in the academic journal and from various authoritative empirical reports (e.g., McKinsey, Harvard Business Review, Deloitte, and MIT Sloan Management Review). The findings from which will be synthesized to encapsulate the current definition of the Metaverse. As for the second question, this research will employ Technology Acceptance Model (TAM) framework as the foundation for gauging the entrepreneurial driving factor to do business in the Metaverse. TAM predicts intention using perceived ease of use and perceived usefulness. Potentially this research contributes by identifying factors affecting each construct through an extensive literature review. This research is a testable conceptual framework that predicts entrepreneurial intention to do business in the Metaverse.

II. METHODOLOGY

This study used a conceptual research method. This method focuses on the Metaverse concept or theory that explains or describes the Metaverse meaning and intention behavior. The conceptual research framework is established to ensure the coherence of this method. Here is a step-by-step process for developing the conceptual research framework (See Fig. 1). First, this research will attempt to provide a clear definition of the term 'Metaverse'. This research synthesizes the definition of Metaverse documented in the academic literature, empirical report, and expert opinion. The synthesis result will serve as a reference to orient this research forward. The second step is to determine the framework on which this research's conceptual model will be based. In doing so, this research considers previous intention behavior models in the literature. The selected model criteria are based on the definition of the term 'Metaverse' this research adopts.

The third step is performing a literature review to identify the potential driving factors of entrepreneurial intention to do business in the Metaverse. This research uses the bibliometric study by [18] to narrow the scope of the search (see Fig. 2). Due to the contemporary nature of this topic, this research will limit its search to the keywords related to the Metaverse that has the most density. Subsequently, this research conducts a review that covers both academic literature and empirical report. On the academic front, the literature was obtained from multiple authoritative databases such as Scopus, Emerald, Science Direct, Google Scholar, and ProQuest. While for the empirical front, the report was taken from prominent sources such as HBR, McKinsey, Accenture, and Forbes. Subsequently, this study selects the literature based on relevance to the research objectives (i.e., defining the Metaverse and investigating the driving factors of entrepreneurial intention to do business in the Metaverse).

The fourth step is formulating the conceptual model. The model will be based on the selected intention behavior theory, where the identified driving factors are used as an extension to the model. The driving factors being selected to incorporate the conceptual model should fulfill a certain criterion: that both experts corroborate their positive relationship towards Metaverse adoption intention in the empirical report and researchers in the previous literature.

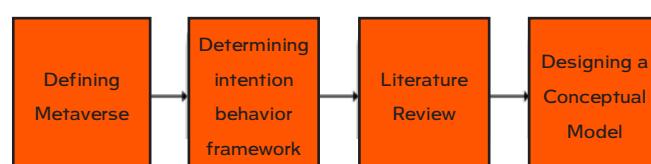


Fig. 1. Conceptual Research Framework

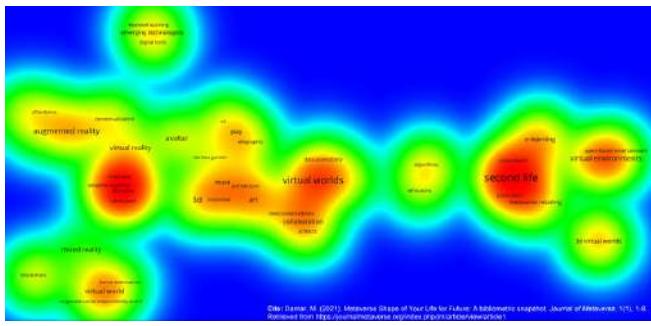


Fig. 2. Bibliometric Snapshot [18]

III. RESULTS

A. What is the Metaverse?

As of today, society applies the term 'Metaverse' loosely. At times the term is used to represent activities of Cryptocurrency, NFT, and virtual real estate (The Sandbox and Decentraland) instead of what is being described by Zuckerberg. Therefore, to reduce the ambiguity, it is necessary first to determine the definition of the term 'Metaverse' used in this research context.

Researchers and practitioners alike have tried to define Metaverse. Most of them agreed that Metaverse takes a form of a virtual world. A study of [14] defines the Metaverse broadly as a shared virtual environment characterized by its interoperable and persistent network in which people can interact simultaneously. In comparison, studies of [20] and [21] suggest that the virtual world of the Metaverse serves as an extension of our physical universe that adds dimensions to economic, social, and leisure activities. However, the description that circulates regarding the Metaverse varies.

On the one hand, [22] suggests that Metaverse is similar to the term ‘internet’ as it comprises multiple virtual reality domains that allow users to store information in blockchain and own digital goods. On the other hand, instead of describing it as multiple domains, [23] argues that the Metaverse refers to a continuum that represents a holistic integration of many virtual domains or platforms that comprises the use of technologies such as VR, AR, and blockchain. Regardless of one’s perspective on the Metaverse, everyone agrees that it involves using an avatar as a digital representation [19] [24]. Moreover, all suggest that the Metaverse requires the support of technologies that includes VR, AR, gaming, machine learning, 3D graphics, blockchain, and sensors [24].

In that regard, for clarity purposes, this research will not adopt a descriptive definition of the Metaverse from the previous researchers and practitioners. Instead, this research will refer to the Metaverse regarding its innate characteristics agreed upon by the majority. Thus, in

this study, the Metaverse comprises 1. A virtual world, 2. The use of avatar as digital representation, and 3. The utilization of supporting technology such as AR, VR, and blockchain. With that laid out, in the remainder of this paper, those three characteristics represent the meaning of the Metaverse term.

B. Technology Adoption Model (TAM)

TAM is a widely used theory to predict the adoption behavior of new technologies. Davis first introduced TAM in 1989 [25]. Since its inception, TAM remains a robust acceptance theory and is still used to measure the user's acceptable behavior toward contemporary technologies [26]. For instance, concerning Metaverse related technology, TAM has been used to investigate the adoption behavior for information technology [27] and cloud computing [28], electronic government adoption [29], and Artificial Intelligence (AI) [30]. TAM estimates intention behavior by measuring the technology's perceived usefulness and ease of use [25]. Perceived ease of use is the rate of difficulties for the technology to use and access. Meanwhile, perceived usefulness represents the degree to which the user believes the technology can increase his/her job performance.

There are other theories to measure adoption behavior, such as the Theory of Planned Behavior (TPB) [31], the Unified Theory of Acceptance and Use of Technology (UTAUT) [32], and the Value-Based Adoption Model (VAM) [33]. TPB has similar characteristics to TAM. However, it expands the analysis toward the potential external factor that may affect adoption intention. Particularly, TPB extends its focus to analyze the societal norms regarding the technology and estimate whether the potential users are affected by it. UTAUT further expands the analysis of the external factors. For instance, it considers the social influence and facilitating conditions antecedents of adoption intention.

On the other hand, VAM dichotomizes adoption intention's precursor as benefit and sacrifice. VAM focuses on the technology's usefulness and potential enjoyment to measure the benefit. Meanwhile, VAM focuses on the technical aspects of the technology and the fees required for its adoption while measuring the sacrifice.

This paper identifies the factors influencing entrepreneurial intent to do business in the Metaverse. For this purpose, the TAM framework will be used as the foundation. The reason for this selection comes two-fold. Firstly, due to the dense technological aspect of doing business in the Metaverse (e.g., the need to integrate AR, VR, and blockchain into the entrepreneurial activity). Secondly, this study focuses on the internal aspects of adoption behavior effectively represented in TAM.

C. Towards the Conceptual Model

One of the expected results of this research is to present a conceptual model that depicts the driving factors for entrepreneurial intention to do business in the Metaverse. For this, the TAM framework is utilized as a core foundation. Meanwhile, the potential driving factors are adopted from previous research through literature review. The literature search is done by considering the definition of the term 'Metaverse' presented in the previous section. Thus, this study attempts to estimate the driving factors for entrepreneurial activities in a virtual world that are carried out using an avatar and technology such as AR and VR. While contemporary research regarding business in the virtual world is sufficient, research specifically investigating the kinds of virtual worlds operated with avatars remains scarce. Therefore, this study uses the study of another virtual world (e.g., Second Life and Habbo Hotel) that bears similar characteristics to the Metaverse as part of the literature review. Investigating entrepreneurial study in Second Life and Habbo Hotel can arguably act as a proxy to estimate driving factors for the entrepreneurial intention in the virtual world using an avatar. Apart from that, the literature review covers the current study regarding the emerging platform of the Metaverse in the academic literature and other authoritative sources such as McKinsey, HBR, and Accenture. The conceptual model from the literature review is presented in Fig. 2. The remainder of this section elaborates on each driving factor.

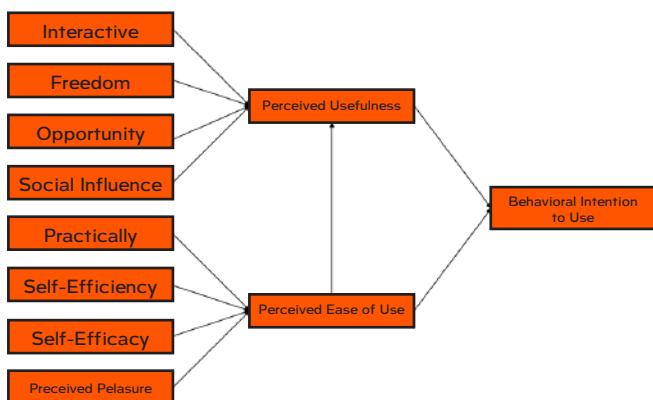


Fig. 2. Conceptual Model

D. Interactivity

Metaverse ensures users' virtual platform interactions through interactivity that ensures synchronous learning, real-time, and interoperability [34]. User interactivity also refers to human-computer interaction [35]. Interactivity can be defined as the ability to move and navigate through a virtual environment and the users' ability to interact with virtual objects, other users, and AI-controlled agents and control the virtual environment in real-time [36] [37]. Agents with advanced AI capabilities can interact in more realistic ways, such as providing helpful information, displaying emotions, recognizing individuals,

and recalling interactions. As a result, the ability of users to interact with virtual content is a critical component of immersive VR. Because Metaverse environments are highly interactive, users engage with information in an active rather than passive manner, which may positively affect perceived ease of use and perceived usefulness. According to [14], interactivity positively affects the perceived ease of use and perceived usefulness of early metaverse platform users.

E. Freedom

Freedom It is usually affiliated with statistical tests or affiliation methodologies relating to flimsy philosophical discussions about free will. Freedom is portrayed as a human brain-created fantasy [38]. Perceived freedom is possibly more closely related to internal motivation. Perceived freedom has a detectable element of playfulness [39]. One of the Metaverse's potential is greater freedom to create and share [40]. In the Metaverse, the participant's identification (ID) aligns with reconfiguring the virtual world's regulations, obtaining unrestricted freedom and character supremacy. However, neither party can afford it [41]. Metaverse, which further provides its users with complete freedom, represents a significant advancement in Internet technology [42]. As a result, users can enjoy a relatively high level of safety and freedom [43]. Finally, the demands for virtual world freedom, Internet content and interaction methods are constantly increasing. To put it another way, Metaverse could construct a linear social environment that seems distinct from consumers' real social connections, elaborating consumers' freedom, liberating them from the constraints of the real world, and broadening friendship circles [44].

F. Opportunity

A study of [45] contends that its exploration of a critical intangible opportunity is frequently a matter of serendipity within a legal context - not only a coincidence, and yet challenging work as well as good fortune combined with sustained attention but also versatility. Opportunity requires a broad understanding that includes all methods for improving effectiveness. These include innovative and oblique thoughts in plan formulation, taking advantage of favorable conditions, abolishing negative behavior patterns, and looking for better tough choices among all targets, together with non-measurable objectives [46]. Delivering a unique and special service and user deriving can create more opportunities to engage but instead be involved throughout the entire experience [47]. Study of [48] trust that the Metaverse presents a significant opportunity for using human-centered methods to expand high-value-added candidates in a modern trend of Cyber-Physical Systems.

G. Social influence

The influence of acquaintances' opinions (e.g., family and friends) on personal behavior to use a particular technology is called social influence. According to the Social Influence Theory, consumers tend to follow the opinions of those around them whom they consider important [17]. The users may use the Metaverse platforms based on the recommendations or expectations of others. Social influence combines subjective norms, social factors, and theoretical images [49]. Previous studies have found that social influence can affect perceived ease of use, perceived usefulness, and intention to use metaverse platforms. According to the [14] study, social influence positively affected early users' perceived ease of use and perceived usefulness of Metaverse platforms. Furthermore, social influence was discovered to influence university students' perceived usefulness and intention to use Metaverse [17]. In addition, social influence affects the intention to use Fintech Digital Sandbox [16].

H. Practicality

Practicality becomes one of the most important things to be considered by business owners to get the attention needed to maintain their customers [50]. Metaverse is a user-experienced platform based on ease of use due to the developing tech-savvy customer [51]. Furthermore, the Metaverse was being developed apart from the practice towards ease of use. The Metaverse also allows the business owner to practice conducting business in the Metaverse with a faster learning process. Moreover, getting new roles accommodates each need inside the Metaverse [24]. The Metaverse itself offers vast business potential. Through the limitation of space that can connect the business owner with the customer by using the mobile device, those are the ideas that have been developed in the last few years that can be regarded as a breakthrough in the practicality and ease of use of Metaverse technologies [24].

I. Self-Efficiency

Self-efficiency in the Metaverse also became one of the considerations for consumers and business owners to conduct business in Metaverse because the Metaverse was considered a co-creation world established by the business communities [52]. The new iteration of the internet is still being developed, and it is believed that it will have a massive implication both for the consumer and the business owner to give them enough self-efficiency to conduct business in the Metaverse [52]. The new economic dynamics of the Metaverse are offering digitized and decentralized data ownership to give every person in the society an improved self-efficiency to deal in the Metaverse through a decentralized financial system.

It offers security and gives personalized data privacy that will soon advance to the trend of data portability [53]. The effort to improve the self-efficiency of each party involved in the Metaverse will undoubtedly lead to the ease of use of the Metaverse itself. It can happen by continuously developing the facilities and technologies to accommodate the security demands of the economy in the Metaverse [54].

J. Self-Efficacy

Self-efficacy refers to people's expectations, judgment, and beliefs about an individual's ability to complete a task successfully and take action [17] [55]. Self-efficacy is a self-evaluation that influences individuals' decisions, efforts, and behavioral mastery [56]. The greater sense of self-efficacy, the easier it is to accept and positively influence the use of new information technologies such as the Metaverse. The perceived ease of use of early users of metaverse platforms was positively influenced by self-efficacy [14]. Self-efficacy also influenced university students' perceived ease of use and intention to use Metaverse [17].

K. Perceived Pleasure

Pleasure can be considered evolution's boldest trick, motivating an individual to pursue rewards necessary for fitness. Yet, in modern environments of abundance, it also induces maladaptive pursuits such as addictions [57]. A sedative item might cause various responses in various subjects, for instance, pleasure, a sensation of the brilliant, misery, misfortune, or distress. Additionally, specialists consider pleasure the broadest inclination liable for the customer experience [58]. Many studies have shown that enjoyment or pleasure significantly impacts user acceptance of a computer in the workplace. Inner motivations manifest as enjoyment or pleasure, directly impacting the intention to continue using. The greater the level of enjoyment or pleasure, the greater the level of satisfaction; efforts should be made to determine usage continuance intention and enjoyment to increase satisfaction [59].

IV. DISCUSSION

The expanded TAM was used to investigate the factors influencing the intention to use the Metaverse: content quality, perceived pleasure or enjoyment, social influence, and self-efficacy. The antecedent variables of the extended TAM, perceived usefulness, and perceived ease of use influenced the intention to use the Metaverse. Besides that, perceived ease of use influences perceived usefulness. The perceived ease of use, perceived usefulness, and intention to use Metaverse were all affected by the content quality and perceived pleasure enjoyment [17].

The researchers discovered that perceived ease of use is positively influenced by self-efficacy, perceived curiosity, and perceived pleasure. Moreover, perceived usefulness is positively influenced by social norms, perceived pleasure, and perceived ease of use. Perceived curiosity, perceived pleasure, and self-efficacy all have a positive influence on perceived ease of use. As such, when Metaverse innovation gives the client the pleasure and curiosity to examine it, that will assist with feeling ease of use of Metaverse innovation [60]. Perceived usefulness was positively influenced by perceived pleasure, social norms, and perceived ease of use. The greater the user's pleasure from technology, the greater the user's usefulness, and when technology is simple to use its usefulness increases. This perceived level of pleasure or enjoyment helps users understand new technology and a superior comprehension of innovation by permitting them to appreciate utilizing it [60].

V. CONCLUSION

Metaverse is a socialized digital environment that develops and builds to facilitate people to communicate with each other through the limitless barrier of digital technology networks. The TAM can be considered one of the models that can predict the adoption of the new technology. The Metaverse development adoption regarding the business industry can be seen from the perceived ease of use and perceived usefulness that consist of several factors that have already been mentioned and explained in the paragraph above. There are factors included in the TAM model of Metaverse. First, Interactivity, Freedom/Agency, Opportunity, and Social Influence for Perceived Usefulness. Second, Practicality, Self-Efficiency, Self-Efficacy, and Perceived Pleasure for Perceived Ease of Use.

The Metaverse is a new frontier. Despite the existence of the Metaverse agenda back in 2007 [61], the topic remains vague and speculative. Therefore, the current state of academic literature regarding the topic is bare. Thus, this study fills the literature gap by compiling potential driving factors for entrepreneurs to do business in the Metaverse. Remarkably, this study adds to the discussion in the entrepreneurial literature that focuses on business in the virtual world. This study's result benefits the developer of the Metaverse platforms and policymakers. For instance, as developers, the compilation of potential driving factors for the entrepreneur in this study can be considered for future improvement due to the importance of entrepreneurs' role in attracting users and creating various forms of economies inside the Metaverse. For policymakers, the proposed conceptual model can be used as part of the guidance for policy formulation, particularly those concerning the regulation of the Metaverse.

The managerial implication of the study defines that

corporations must constantly reimagine their business models and offerings to remain competitive in a fast-changing environment. It is due to the emergence of advanced digital technologies, the shortening of technology life cycles, and changes in customer demand and intention behavior. Nonetheless, internet users create accounts and profiles to access retail products and services, which are then personalized and used as a platform for targeted advertising. Moreover, Metaverse gives all new ways of personalizing promotion for its company and targets. It is often the case in the Metaverse platform when users visit crowded retail areas. An automated system detects a user's presence. It sends out 'notecards' with personal data regarding different services and products. This study will help managers predict entrepreneurial intention to do business in the Metaverse to pay more attention to the factors based on a conceptual model easily and effectively. This approach also will help managers better understand the potential users of the Metaverse platform perspective. Therefore, managers can design specific strategies to attract more potential users of the Metaverse platform.

Despite the theoretical and practical contributions presented through the study's findings, future research must address some limitations. First, the findings of this study are expected to provide many ideas as primary data for future metaverse research. This study also contributes to entrepreneurs looking to start a business in the Metaverse as a source of competitive advantage. However, the conceptual research method has limitations despite its contribution. We intend to conduct future research using mixed methods. Extending this research may assist metaverse designers in creating more appealing metaverse platforms for entrepreneurs. Second, this study focuses on the factors that motivate entrepreneurs to conduct business on various metaverse platforms. As a result, research on a specialized topic will be required for future research. For example, the research could investigate specific Metaverse platforms or companies. Metaverse platforms or company-specific usage circumstances can influence driving factors for entrepreneurs to do business. Finally, only two TAM constructs were used in this study: perceived ease of use and perceived usefulness. Other constructs that could affect the proposed model should be considered in future research.

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Paper 88

Cryptocurrency as an Investment Instrument for Generation Z in Indonesia

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ICMEM

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Abstract - This research was conducted to find whether cryptocurrency is a suitable investment instrument for Generation Z in Indonesia by analyzing factors that could affect investment decisions in Generation Z to find the causes and effects of Generation Z's readiness to start investing in cryptocurrency. The investment decision factors that are examined in this research are financial literacy, herding behavior, risk averse, and risk perception. Data collected during a survey aimed at Generation Z in Indonesia was processed using path analysis methods with the help of SPSS software. The result showed that financial literacy, risk averse and risk perception had a significant effect on Indonesian Generation Z investment decisions. While herding behavior does not significantly affect the decision-making of Indonesian Generation Z to make an investment in cryptocurrency, the result led to the conclusion that cryptocurrency is a suitable investment instrument for Generation Z in Indonesia, with some recommendations that could be implied on investing in cryptocurrency based on this research result by improving the shortcoming of each investment decision-making factor.

Keywords - Cryptocurrency, Generation Z, Investment Decisions.

I. INTRODUCTION

A. Research Background

Day after day, technology evolves alongside the growth of knowledge. People are starting to follow this trend. In the Industry 4.0 era, technologies started to shift into digitalization, improving automation and connectivity to a higher level. The introduction of new digitised money known as cryptocurrency became one of the highlights of this industrial revolution. The first-ever invented cryptocurrency known as bitcoin was founded by a group of people who called themselves Satoshi Nakamoto in late (2008).

Bitcoin was introduced as a digital currency that implements blockchain technology. Contains transaction logs from computers' participation across the network, making Bitcoin able to adapt to the peer-to-peer form for its transactions. With this foundation, a slew of alternative digital currencies based on the same principles as bitcoin began to emerge during the last decade. Based on the data

from Statista and Bloomberg by the mid-quarter of 2021, there are more than 6000 coins in the cryptocurrency market (Best, 2021) with a market value of around \$45 billion (Kharif, 2021).

People began to perceive cryptocurrencies as an acceptable transaction commodity and profitable investment due to their large number of varieties and value. According to a survey on CNBC, at least one out of every ten persons in the world uses and invests in cryptocurrencies. According to the poll results, cryptocurrencies are presently the fourth most popular investment commodity behind real estate, stocks, mutual funds, and bonds (Reinicke, 2021). In addition, (Ilham, et. al, 2022) stated the number of cryptocurrency investors has been increasing along with the emergence of local cryptocurrencies exchange markets in early 2021. Data shown by Investor.id shows that the number of cryptocurrency investors in Indonesia is increasing by 180%, and surprisingly that 66% of the investors are in the age of 18 - 35 years old (Olavia, 2022).

In comparison to other investment commodities, cryptocurrency is well renowned for its high return and profitability in very short time periods. Consider the case of one of the cryptocurrencies known as dogecoin. In reference to Statista, the price and value of dogecoin increased by 216 percent overnight in early 2021, and the market worth increased six-fold in a short period of time. However, the price continues to fall in a brief amount of time before returning to its regular level by the end of May 2021 (Best, 2021).

B. Problem Statement

Dogecoin demonstrated that cryptocurrencies have a high return with a significant risk in a very short period. During the same time, the number of cryptocurrencies in Indonesia significantly increased specifically among the Generation Z. Looking at the situation, researchers want to examine if cryptocurrencies have the potential to become a viable investment instrument for Generation Z in Indonesia, or if it is better to invest in other commodities.

C. Research Questions

To arrive at a conclusion, researchers compile the data into research questions that will be utilised to guide the investigation. As a result, the research question is:

1. How Does the Investment Decision Factor affect the Generation Z Investment on Cryptocurrency?
2. How prepared Generation Z in Indonesia to Invest in Cryptocurrency?

D. Research Objectives

1. To find the causes and effects relation between several factors that could affect the investment decision Generation Z on investing in cryptocurrency.
2. To analyse whether Generation Z in Indonesia is prepared to invest in cryptocurrency
3. To recommend what possibly could be improved by Generation z in Indonesia before or during deciding in investing in cryptocurrency.

E. Research Limitation

This research is focusing on Generation Z in Indonesia; therefore, the scope is limited to only Indonesian with considered as Generation Z. Variable that will be analysed are also limited to variables that are going to be explained in the literature review. This research was conducted between December 2021 – May 2022.

F. Literature Review

a. Cryptocurrency

Cryptocurrencies are digital financial assets that rely on cryptography decentralised technology to ensure ownership and transfer of ownership (Giudici, Milne, and Vinogradov, 2019). Cryptography decentralised technology that has been used to create a cryptocurrency is called blockchain technology (Wright and De Filippi, 2015). Blockchain technology comes from an automated peer-to-peer network system (Stefan, 2018). Automated peer-to-peer network systems enable the owner to make online transactions with the other party without passing through a financial institution (Nakamoto, 2008).

Cryptocurrency is founded on two concepts: cryptography-based asset disposal and distributed ledger technology. The cryptographic key is used to sign transactions and authenticate ownership in cryptography-based asset disposal (Soehartono and Pati, 2019). Distributed ledger technology (DLT) has emerged as an overarching concept for multi-party systems that operate without a central operator or authority (Rauschs et al, 2018).

b. Investment

Investment is a medium or long-term allocation of resources with the goal of recouping investment expenses and generating a significant profit (Virlics, 2013).

Investment involves putting money into an investment instrument for the purpose of earning more money (Gill, S et al. 2018). Rising investments is an effective approach to enhance output and profits (Reinikka, and Svensson, 2001). Because of increased consumption levels, people are no longer restricted to earning income from personal savings, and they are developing an interest in personal investment and financial management (Yang, 2022).

c. Cryptocurrency Investment

Cryptocurrencies can be applied as a payment method as well as a form of investment (Giudici, Milne, and Vinogradov, 2019). In addition to traditional financial equity markets, the cryptocurrency market provides new investment instruments for investors (Chowdhury and Mendelson, 2013). Individuals and institutional investors have concentrated on development of cryptocurrency as cryptocurrency rising in recognition (Kristoufek, 2015; Khan et al., 2020). One motive for purchasing a cryptocurrency, at least in the case of Bitcoin, is to make a speculative investment (Glaser et al. 2014).

Cryptocurrency is different from other investment instruments, the price of cryptocurrency is very unstable (Martin et al., 2022) and considered as high-risk trading that has similarity with gambling (Delfabbro, King and Williams, 2021; Mills and Nower, 2019). Soehartono and Pati (2019) stated define cryptocurrency as an asset that has high volatility which may cause short term problems, unpredictable risks even for medium- and long-term investment.

d. Generation Z

Generation Z is a group of people born between 1996 to 2012 (Schweinger, and Ladwig, 2018). In comparison to the previous generation, Generation Z has evolved distinct characteristics (Khalid, 2019). Generation Z are known as well-educated, technologically aware, imaginative, and creative generations (Priporas, Stylos and Fotiadis, 2017). This generation is at ease with the fact that there is more than one way to be itself. Its desire towards authenticity leads to more freedom of expression and a greater willingness to comprehend people from various backgrounds (Francis and Hoefel, 2018).

e. Generation Z Investment Behaviour

According to Fadilah et al. (2022) quoted from Anggarini, Putri, Lina (2021) Generation Z is also known as sandwich generation, which means that generation that has responsibility to fund themself, parents, and its family. This condition motivates generation Z to be more aware about personal finance. Rising personal finance awareness will lead the person to be more aware of financial products and services including investment (Magron, 2012).

According to previous research conducted by Rosdiana in (2020), investment behaviour of Generation Z could be determined by four main factors, thus factors are a) Financial Literacy, b) Herding Behaviour, c) Risk Averse, and d) Risk Perception. Therefore, this research will be focusing on the four main factors with addition of cryptocurrency as the main object of investment instruments.

Financial Literacy

Financial literacy is described as the ability to make reasonable, well-informed decisions about money management (Worthington, 2006). This involves a broad knowledge of budgeting, a conceptual awareness of financial products offered by financial institutions, and the knowledge to make sensible investments to achieve one's financial goals (Nga, Yong and Sellappan, 2010).

Herding Behaviour

Herding behaviour is a kind of follow-up action in which one person follows another for a variety of motives and circumstances (Liem and Sukamulja, 2017). An investor's herding behaviour mostly happens due to the influence of the investors around them. A person with herding behaviour is easily convinced by the judgments of others, and this has an impact on investment decisions (Rosdiana, 2020).

Risk Averse

Risk aversion is a mindset owned by investors to avoid risk, alternatively it may be said that the investor will only invest if the predicted return would be higher than the risk (Sudana and Sallama, 2015). The purpose is to avoid losses to make good investment decisions (Irjayanti, 2017). Risk Averse can be measured by some indicators such as individual rationality, courage to reject risk, and performance to maximise wealth under limited alternatives of investment (Farooq and Sajid, 2015).

Risk Perception

Risk precipitation is a method of perception, evaluations, and analysis of an investment instrument's risk in relation to investment decisions by investors (Irjayanti, 2017). Terms of psychological considerations, every investor evaluates a risk in a unique way. (Rosdiana, 2020). According to research by Ullah (2015) Risk perception can be measured by the fear of investing in the stock with guaranteed profit, caution about unexpected market changes, concern about investing in stocks with a negative performance, and fear of investing in stocks with a favourable performance, to mention a few. However, the main object of this research is cryptocurrency, therefore the measurement will be improved a little bit by changing

the stocks market to cryptocurrency market (Ullah, 2015).

Investment Decision

Investment decision is a judgement to invest in an investment instrument that will result in the most utility or projected profit (Fachrudin and Fachrudin, 2016). After a thorough examination of the investment instrument, investment decisions are made (Virlics, 2013). Rosdiana (2020) mentioned that understanding the investment objective and estimating the return on investment can help to measure the investment decisions.

Prepared to Invest

Koonce (2011) stated that the effect of being prepared before investing is to prevent the unwanted result and achieve the investment objectives, the paper is also mentioned that before starting investment, person should know about their investment objectives or financial objectives, adequacy of investment funds, investment instrument, managing risk, and eliminate debt (Koonce, 2011).

G. Research Framework

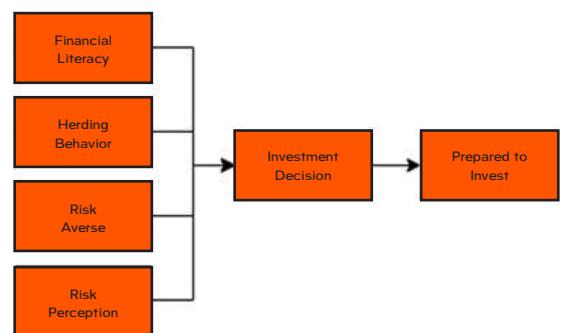


Figure 1: Research Framework

H. Hypothesis

- H1 : Financial literacy affect Generation Z in Indonesia to make investment decisions on cryptocurrency
- H2 : Herding Behaviour affect Generation Z in Indonesia to make investment decisions on cryptocurrency
- H3 : Risk Averse affect Generation Z in Indonesia to make investment decisions on cryptocurrency
- H4 : Risk Perception affect Generation Z in Indonesia to make investment decisions on cryptocurrency
- H5 : Generation Z in Indonesia is prepared to start or make an investment in Cryptocurrency based on evaluation of Investment Decision Factor

II. METHODOLOGY

Saunders, Lewis, and Thornhill (2009) present research onion model to explain several steps to create a better organized research methodology. Applying the research onions theory, this research will be adapting positivism philosophy to investigate this research. Supported with deduction theory development. Therefore, this research will be conducted using quantitative methods to test the developed hypothesis in order to reach the conclusion. Data that are needed will be collected using surveys to respondents who meet the criteria in accordance with this research.

Data will be collected using a survey method. Specifically, through online questionnaires methods, so target respondents could easily fill out the survey. The data acquired by conducting a survey is trustworthy because it is confined to the options offered, and it has an advantage in data analysis because it is relatively straightforward in coding, processing, and interpretation (Malhotra, 2010). To achieve expected results, the questionnaire is given with a short explanation about the research, filling guide, and brief explanation on each part according to the research problems and variables.

This research is conducted on specific demographics such as Generation Z and Indonesia citizens. According to literature review, Generation Z are people born from 1996 until 2012, therefore the targeted samples are Indonesians aged 11 - 26 years old. However, not all the Generation Z is eligible to do or perform cryptocurrency trading in Indonesia therefore, this research is more focused on Generation Z with age over 17. The number of samples needed are 200 samples. Yet the gathered data is 219, therefore the researcher used all of the data and the sample size became 219.

The survey questions will consist of designed questions to measure each of the variables that will be tested in this research. Start with the consent form, personal identity to match up the data with respondent requirements, and each variable questions in the form of statements or conditions that might be related with the respondents. The respondents are expected to evaluate whether the statements or conditions are related to them or not by using the Likert scale from 1 to 5. Where 1 means totally disagree with the questions and 5 means strongly agree with the questions. The questions are made based on the table below (Table 1) of questionnaire guidelines.

Table 1: Questionnaire Guideline

Variable	Indicator Label	Measurement Indicator	Scale
Financial Literacy	FL1	Understanding of personal finance situation	Likert Scale from 1 to 5
	FL2	Personal financial budgeting	
	FL3	Setting financial priorities	
	FL4	Knowledge of financial products / instruments and services.	
Herding Behaviour	HB1	Influence of others to start investing	Likert Scale from 1 to 5
	HB2	Influence of other investors' decision to decide commodity (coins).	
	HB3	Reaction towards other investors decisions	
	HB4	Source of Information	
Risk Averse	RA1	Individual rationality toward risk	Likert Scale from 1 to 5
	RA2	Courage to prevent risk	
	RA3	Maximise profit under limited alternative	
Risk Perception	RP1	Caution of high risk investment	Likert Scale from 1 to 5
	RP2	Caution about unexpected market changes	
	RP3	Concern on negative performance market	
Investment Decisions	ID1	Knowing investment objectives	Likert Scale from 1 to 5
	ID2	Having an understanding about investment market and capital growth and how to measure it.	
	ID3	Planning before starting investment	
Prepared to Invest	PI1	Understanding investment risk	Likert Scale from 1 to 5
	P2	Availability of Investment Funds	
	P3	Readiness to accept risk and profitability	
	P4	Understanding of cryptocurrency characteristics	

From the questionnaire guideline, online surveys are made. Surveys are conducted through google form platform. The survey itself is made in two versions to prevent language barrier from the respondents.

Aikern, West and Pitts (2003) stated that the method to analyse the relationship between a set of independent variables with a single variable (or criteria) is multiple regression analysis. There is an extension version regression model that is used to examine the validity of the correlation matrix against two or even more causal hypotheses that the researcher is investigating called path analysis. Regression path analysis is performed for each variable in the model as a dependent on others that the model suggests are causes (Garson, 2013). Therefore, data analysis that will be used in this research is path analysis. In addition, the data is analysed using SPSS programs with following stages,

A. Descriptive Analysis

Descriptive analysis is a statistic that is used to evaluate data by summarising data that has been acquired as it is without the intention of drawing generalizable conclusions or generalisations (Sugiyono, 2013).

B. Data Quality Test

a. Data Validity Test

Data validity test is a measurement to test whether

the data that has been collected is valid to be used for research (Rosdiana, 2020). Measuring validity can be accomplished by comparing the value of r arithmetic with r tables for degree of freedom ($df = n-2$, where (n) is the number of study samples. If r arithmetic is greater than r table and the value is positive, the item, query, or indicator is judged valid (Ghozali, 2009).

b. Data Reliability Test

Data reliability test is a measurement to test the consistency of variable questions from the survey that was conducted. Consistency can be seen through Cronbach alpha calculation and can be declared as a consistent variable if the result of Cronbach alpha is bigger than 0.6 (Rosdiana, 2020).

C. Classic Assumption Test

a. Normality Test

Objective of the normality test is to test whether the independent and dependent variables from the conceptual framework are both normally distributed or not. The Kolmogorov-Smirnov test is the traditional assumption test for normality; with this test, data can be known to be regularly distributed or not. If the assumption sig. (2-tailed) is greater than 0.05, the data is normally distributed, and if the assumption sig. (2-tailed) is less than 0.05, the data is not normally distributed (Santoso, 2002).

b. Multicollinearity Test

The multicollinearity test seeks to determine whether there is a relationship between independent variables (independent). A good model should not have any independent variables. Detection of multicollinearity by assessing tolerance values and Variance Inflation Factors (VIF) less than 10 and tolerance values more than 0.1 (Ghozali, 2009).

c. Heteroscedasticity Test

The heteroscedasticity test determines whether there is unequal variance between the residuals of one observation and the residuals of another in the regression model. If the variance between one observation's residual and another's constant, this is referred to as homoscedasticity; if the variance varies, this is referred to as heteroscedasticity. A decent regression model is one in which homoscedasticity or heteroscedasticity does not arise (Rosdiana, 2020).

D. Path Analysis

Garson (2013) explained that Path analysis necessitates the standard regression assumptions. It is particularly sensitive to model specification because the absence of relevant causal variables or the inclusion of extraneous variables frequently has a significant impact on the

path coefficients, which are used to assess the relative importance of various direct and indirect causal paths to the dependent variable.

a. Hypothesis Testing

Determination of the Coefficient Test (R2)

Rosdiana (2020) quoted on her research from Ghozali (2009) that the magnitude of the coefficient of total determination is used to determine how much the ability of the independent variables to explain the dependent variable is (R^2). A close to one value indicates that the independent variables supply nearly all of the information required to forecast variations in the dependent variable.

Statistical T-Test

Statistical analysis, the statistical t-test determines how much influence one independent variable has on the variation of the dependent variable (Rosdiana, 2020). Based on research from Priyanto (2014). The probability of its relevance can be used as the basis for decision making with condition if the significance probability value of variable is lower than the maximum value of significance of confident level, then the hypothesis is accepted, in other words, if the significance probability value of variable is higher than the maximum value of significance of confident level, then the hypothesis is rejected.

Statistical F-Test

The F-test is used to show whether all the independent or independent variables contained in the model have a joint effect on the dependent or dependent variable (Ghozali, 2006). Amal, Kusnadi, and Nugraha (2022) mentioned that the hypothesis will be rejected if f arithmetic is greater than f table, in the other word, hypothesis is accepted if f arithmetic is less than f table.

III. RESULTS

A. Descriptive Analysis

a. Respondents' Demographic

Age

Table 2: Age Descriptive Statistic

Criteria	Frequency	Percentage
17 - 21 Years Old	183	83.56%
22 - 27 Years Old	36	16.44%
Total	219	100%

Gender

Table 3 : Gender Descriptive Statistic

Criteria	Frequency	Percentage
Male	63	28.77%
Female	151	68.95%
Prefer not to say	5	2.28%
Total	219	100%

Investment or Interest on Cryptocurrency

Table 4 : Investment or Interest on Cryptocurrency Descriptive Statistic

Criteria	Frequency	Percentage
Yes	189	86.30%
Maybe	30	13.70%
No	0	0%
Total	219	100%

b. Variables

Financial Literacy

Table 5: Financial Literacy Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
FL1	4.52	5.00	5.00	0.69
FL2	4.40	5.00	5.00	0.70
FL3	4.37	4.00	5.00	0.68
FL4	4.11	4.00	4.00	0.76

Herding Behavior

Table 6 : Herding Behaviour Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
HB1	3.78	4.00	5.00	1.13
HB2	3.68	4.00	4.00	1.08
HB3	3.53	4.00	4.00	1.06
HB4	3.53	4.00	4.00	1.07

Risk Averse

Table 7 : Risk Averse Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
RA1	4.42	5.00	5.00	0.76
RA2	4.24	4.00	5.00	0.78
RA3	4.18	4.00	4.00	0.81

Risk Perception

Table 8 : Risk Perception Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
RP1	4.41	5.00	5.00	0.77
RP2	4.28	4.00	4.00	0.77
RP3	4.17	4.00	4.00	0.80

Investment Decisions

Table 9 : Investment Decisions Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
ID1	4.49	5.00	5.00	0.74
ID2	4.31	4.00	4.00	0.74
ID3	4.28	4.00	4.00	0.72

Prepared to Invest

Table 10 : Prepared to Invest Descriptive Statistic

Variable	Mean	Median	Mode	Std. Dev
PI1	4.23	5.00	5.00	0.97
PI2	4.15	4.00	4.00	0.93
PI3	4.05	4.00	4.00	0.84
PI4	4.15	4.00	4.00	0.76

B. Data Quality Test**a. Data Validity Test****Financial Literacy**

Table 11 : Financial Literacy Data Validity Test

		FL1	FL2	FL3	FL4	TOTAL
FL1	Pearson Correlation	1	0.651**	0.400**	0.376**	0.800**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	219	219	219	219	219
FL2	Pearson Correlation	0.651**	1	0.388**	0.428**	0.817**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	219	219	219	219	219
FL3	Pearson Correlation	0.400**	0.388**	1	0.287**	0.680**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	219	219	219	219	219
FL4	Pearson Correlation	0.376**	0.428**	0.287**	1	0.712**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	219	219	219	219	219
TOTAL	Pearson Correlation	0.800**	0.817**	0.680**	0.712**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	219	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

Herding Behavior

Table 12 : Herding Behavior Data Validity Test

Correlations

		HB1	HB2	HB3	HB4	TOTAL
HB1	Pearson Correlation	1	.651**	.577**	.596**	.830**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	219	219	219	219	219
HB2	Pearson Correlation	.651**	1	.670**	.646**	.866**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	219	219	219	219	219
HB3	Pearson Correlation	.577**	.670**	1	.724**	.865**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	219	219	219	219	219
HB4	Pearson Correlation	.596**	.646**	.724**	1	.864**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	219	219	219	219	219
TOTAL	Pearson Correlation	.830**	.866**	.865**	.864**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	219	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

Risk Averse

Table 13: Risk Averse Data Validity Test

Correlations

		RA1	RA2	RA3	TOTAL
RA1	Pearson Correlation	1	.576**	.451**	.809**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	219	219	219	219
RA2	Pearson Correlation	.576**	1	.558**	.859**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	219	219	219	219
RA3	Pearson Correlation	.451**	.558**	1	.817**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	219	219	219	219
TOTAL	Pearson Correlation	.809**	.859**	.817**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

Risk Perception

Table 14: Risk Perception Data Validity Test

Correlations

		RP1	RP2	RP3	TOTAL
RP1	Pearson Correlation	1	.661**	.473**	.844**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	219	219	219	219
RP2	Pearson Correlation	.661**	1	.534**	.869**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	219	219	219	219
RP3	Pearson Correlation	.473**	.534**	1	.804**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	219	219	219	219
TOTAL	Pearson Correlation	.844**	.869**	.804**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

Investment Decision

Table 15 : Investment Decision Data Validity Test

Correlations

		ID1	ID2	ID3	TOTAL
ID1	Pearson Correlation	1	.418**	.434**	.800**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	219	219	219	219
ID2	Pearson Correlation	.418**	1	.347**	.761**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	219	219	219	219
ID3	Pearson Correlation	.434**	.347**	1	.762**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	219	219	219	219
TOTAL	Pearson Correlation	.800**	.761**	.762**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

Prepared to Invest

Table 16 : Prepared to Invest Data Validity Test

Correlations

		PI1	PI2	PI3	PI4	TOTAL
PI1	Pearson Correlation	1	.700**	.518**	.489**	.850**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	219	219	219	219	219
PI2	Pearson Correlation	.700**	1	.690**	.426**	.879**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	219	219	219	219	219
PI3	Pearson Correlation	.518**	.690**	1	.441**	.812**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	219	219	219	219	219
PI4	Pearson Correlation	.489**	.426**	.441**	1	.700**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	219	219	219	219	219
TOTAL	Pearson Correlation	.850**	.879**	.812**	.700**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	219	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

b. Data Reliability Test

Table 17 : Reliability Analysis

Variable	Cronbach Alpha	Reliability Test
FL	0.742	Reliable
HB	0.878	Reliable
RA	0.770	Reliable
RP	0.789	Reliable
ID	0.666	Reliable
PI	0.829	Reliable

C. Classic Assumption Test

a. Normality Test

Table 18 : Normality Analysis

Unstandardized Residual		
N		219
Normal Parameters ^a	Mean	.0000000
	Std. Deviation	1.30039956
Most Extreme Differences	Absolute	.035
	Positive	.031
	Negative	-.035
Test Statistic		.035
Asymp. Sig. (2-tailed)		.200**

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Statistical Test	P-value (Asymp. Sig. 2-tailed)	Normality
0.035	0.2	Normally Distributed

b. Multicollinearity Test

Table 19 : Multicollinearity Analysis

Coefficients ^a						
Model	Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics
	B	Std. Error				
1 (Constant)	4.384	0.827		5.301	0.000	
FL	0.198	0.056	0.247	3.525	0.001	0.556 1.799
HB	-0.056	0.025	-0.122	-2.228	0.027	0.906 1.104
RA	0.088	0.061	0.100	1.447	0.149	0.568 1.762
RP	0.219	0.062	0.251	3.552	0.000	0.544 1.839
PI	0.128	0.041	0.214	3.085	0.002	0.568 1.762

a. Dependent Variable: ID

c. c. Heteroscedastic Test

Table 20 : Heteroscedastic Analysis

		Coefficients ^a			
Model	B	Unstandardized Coefficients		Standardized Coefficients	
		Std. Error	Beta	t	Sig.
1	(Constant)	2.707	0.472		5.739 0.000
	FL	-0.044	0.032	-0.117	-1.350 0.178
	HB	0.002	0.015	0.008	0.113 0.910
	RA	-0.172	0.073	-0.157	-2.368 0.068
	RP	-0.048	0.033	-0.120	-1.460 0.146
	PI	-0.019	0.023	-0.068	-0.807 0.421

a. Dependent Variable: ABS_RES

D. Path Analysis

Path analysis in this research will be divided into two models. The first one will analyse the first model where the independent variables are financial literacy (FL), herding behaviour (HB), risk averse (RA), risk perception (RP) and the dependent variable is investment decision (ID). The second model will be using investment decision (ID) as the independent variable and Prepared to Invest (PI) as the dependent variable.

a. Path Analysis Model I

Formulation of First Model

Table 21 : Path Analysis Model I

		Coefficients ^a			
Model	B	Unstandardized Coefficients		Standardised Coefficients	
		Std. Error	Beta	t	Sig.
1	(Constant)	4.299	0.843		5.101 0.000
	Financial Literacy	0.261	0.054	0.324	4.862 0.000
	Herding Behaviour	-0.036	0.025	-0.079	-1.459 0.146
	Risk Averse	0.131	0.060	0.150	2.177 0.031
	Risk Perception	0.240	0.062	0.276	3.851 0.000

a. Dependent Variable: Investment Decision

According to the conceptual framework of this research, the independent variable (X) for model I are Financial Literacy (X1), Herding Behaviour (X2), Risk Averse (X3), Risk Perception (X4) and the dependent variable (Y) is Investment Decision. Therefore, the formulation for model I will be:

$$ID = \beta_0 + \beta_1 FL + \beta_2 HB + \beta_3 RA + \beta_4 RP + \epsilon$$

From the table above (Table 21) the formula obtained from this research is:

$$ID = 4.299 + 0.261FL - 0.036HB + 0.131RA + 0.24RP$$

Statistical T-Test

Table 22 : Statistical T-Test Model I

Variable	Sig.
FL	0.000
HB	0.146
RA	0.031
RP	0.000

Referring to table above (Table 22). There are three independent variables (Financial Literacy, Risk Averse, Risk Perception) are partially influence dependent variable (Investment Decision) because of the significance value of all of three independent variables are less than 0.005 (FL = 0.000, RA = 0.031, RP = 0.000). Herding behaviour does not partially influence Investment Decisions, because the significance value of Herding behaviour is equal to 0.146 (greater than 0.05).

Statistical F-Test Model 1

Table 23 : Statistical F-Test Model I

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	F
1	Regression	250.560	4	62.640	34.807
	Residual	385.121	214	1.800	
	Total	635.680	218		

a. Dependent Variable: Investment Decision

b. Predictors: (Constant), Risk Perception, Herding Behaviour, Financial Literacy, Risk Averse

Referring to table above (Table 23). The significance value of model I regression is 0.000., meaning that are a joint influence between a set of independent variables (Financial Literacy, Herding Behaviour, Risk Averse, Risk Perception) towards dependent variables (Investment Decisions).

Coefficient of Determination (R2)

Table 24 : Coefficient of Determination Model I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.628 ^a	0.394	0.383	1.342

a. Predictors: (Constant), Risk Perception, Herding Behaviour, Financial Literacy, Risk Averse

Referring to table above (Table 24), the adjusted R square of model I is 0.383, meaning that the contribution of independent variables of the first model (Financial Literacy, Herding Behaviour, Risk Averse, Risk Perception) toward the dependent variable (Investment Decisions) that is tested in this research is 0.383 or 38.3%.

b. Path Analysis Model II

Formulation of second model

Table 25 : Path Analysis Model II

Model	Coefficients*				
	B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	5.805	1.304		4.451	0.000
Investment Decision	0.823	0.099	0.492	8.323	0.000

a. Dependent Variable: Prepared to Invest

According to the conceptual framework of this research, there is only one independent variable (X) for model II which is Investment decision, and the dependent variable (Y) is Prepared to Invest. Therefore, the formulation for model I will be:

$$PI = \beta_0 + \beta_1 ID + \epsilon$$

From the table above (Table 25), the formula obtained from this research is:

$$PI = 5.805 + 0.823ID$$

To determine the influence of independent variable (Investment Decision) to dependent variable (Prepared to Invest) statistical test will be done. But it will be different from the first model because in this model there is only one independent variable to be tested through the dependent variable, meaning there will be no difference between partial and joint influence toward each variable.

Statistical T-Test

Table 26: Model II Statistical T- Test

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	430.782	1	430.782	69.302	0.000 ^b
Residual	1348.871	217	6.216		
Total	1779.653	218			

a. Dependent Variable: Prepared to Invest

b. Predictors: (Constant), Investment Decision

Referring to table above (Table 26). The significance value of model I regression is 0.000, meaning that the independent variable (investment decision) has influence on the dependent variable (prepared to investment). It happens due to the significance value of investment decisions being less than 0.05 (0.00).

Coefficient of Determination (R2)

Table 27 : Coefficient of Determination Model II

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.492 ^a	0.242	0.239	2.493

a. Predictors: (Constant), Investment Decision

Referring to table above (Table 27), the adjusted R square of model II is 0.239, meaning that the contribution of independent variables of the second model (Investment Decisions) toward the dependent variable (Prepared to Invest) that is tested in this research is 0.239 or 23.9%.

c. Path Analysis Diagram

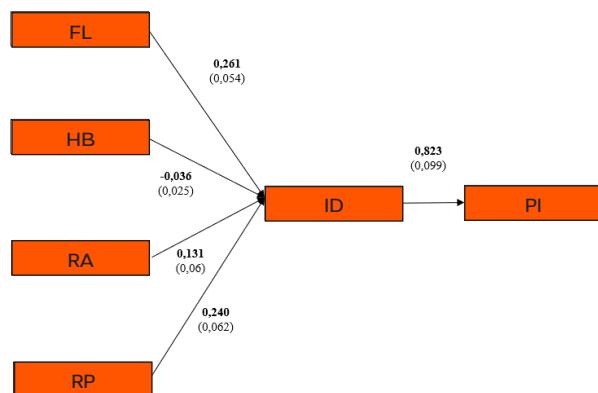


Figure 2 : Path Analysis Diagram

Hypothesis Testing

Table 28 : Hypothesis Testing

Hypothesis	Structural Path	T-Statistics	P-Value	Result
H1	Financial Literacy → Investment Decisions	4.862	0.000	Accepted
H2	Herding Behaviour → Investment Decisions	-1.459	0.146	Rejected
H3	Risk Averse → Investment Decisions	2.177	0.031	Accepted
H4	Risk Perception → Investment Decisions	3.851	0.000	Accepted
H5	Investment Decisions → Prepared to Invest	8.325	0.000	Accepted

Hypothesis will be accepted if T-Statistics of the hypothesis in question is higher than 1.96 and the P-Value or the significance level of the variable is less than 0.05 for 95% confidence level.

IV. DISCUSSION

Based on the data analysis result, all variables used in this research can be determined as valid and reliable data to be carried further for the research, therefore the accuracy

of relationships measurement either directly or indirectly affected between variables is accurate. According to path analysis results from the first and the second models, each independent variable is partially and jointly affecting the dependent variable, except for herding behaviour that has significance value above the maximum value ($0.146 > 0.05$) which implementing that Herding Behaviour is not partially influence Generation Z in Indonesia in making decisions on investing in cryptocurrency.

$$ID = 4.299 + 0.261FL - 0.036HB + 0.131RA + 0.240RP$$

According to path analysis of the first and second model which produce each own path analysis formulation, can be concluded that from the first model with formulation:

This path analysis formulation shown that,

- o O is equal to 4.299, therefore investment decision is also equal to 4.299 if the value of all independent variables is zero or constant.
- o FL is equal to 0.261, meaning that for every increase of one Financial Literacy unit, Investment Decisions will increase by 0.261 with the assumption that other variables have a fixed value.
- o HB is equal to -0.036, meaning that for every increase of one Herding Behaviour unit, Investment Decisions will decrease by 0.036 with the assumption that other variables have a fixed value.
- o RA is equal to 0.131, meaning that for every increase of one Risk Averse unit, Investment Decisions will increase by 0.131 with the assumption that other variables have a fixed value.
- o RP is equal to 0.240, meaning that for every increase of one Risk Perception unit, Investment Decisions will increase by 0.240 with the assumption that other variables have a fixed value.

From the second model formulation,

$$PI = 5.805 + 0.823ID$$

Can be concluded that the path analysis formulation shows,

- o O is equal to 5.805, therefore prepared to invest is also equal to 5.805. If the value of independent variable or investment decisions is either zero or constant.
- o ID is equal to 0.823, meaning that for every increase of one Investment Decisions unit, Prepared to Invest will increase by 0.823.

V. CONCLUSION

From the path analysis, can be concluded that all the hypotheses that exist in this research are accepted except for the Hypothesis 2, meaning that the factors that could affect the investment decision making process of Generation Z in Indonesia to invest in cryptocurrency are financial literacy, risk aversion, and risk perception. Herding behaviour is considered to have no partially direct effect on Generation Z in Indonesia's decision-making process for investment in cryptocurrency. Investment decisions later will affect the preparation of Generation Z in Indonesia before making an investment in cryptocurrency. This argument is strengthened by the calculation results of the coefficient of determination from both path analysis models. The first coefficient of determination showed that the contribution of the independent variables toward the dependent variable is 38.3%, meaning that 38.3% of Generation Z investment decisions on making investments in cryptocurrency are affected by financial literacy, herding behaviour, risk aversion, and risk perception. The second coefficient of determination showed that the contribution of the investment decision variable toward the prepared to invest variable was 23.9%, meaning that the measurement of preparation Generation Z in making an investment on cryptocurrency is affected by 23.9% by investment decision making.

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Paper 89

NFT Development and Ecosystem in Indonesia: The Future of Digital Finances or Just Bubbles?

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ICMEM

The 7th International Conference on Management in Emerging Markets

Abstract - NFTs (non-fungible tokens) are blockchain-based cryptographic assets that cannot be sold or traded for cash. These tokens are becoming more popular in Indonesia, and by 2022, they are predicted to have a significant impact on the worldwide economy. The paper aims to examine the NFT trends, its development and ecosystem in Indonesia, with the following research questions: What are the current trends in Indonesia for non-fungible tokens (NFTs), and how the concept of NFT developed in Indonesia and what is its ecosystem? Based on the literature studies, the NFT trend has risen in popularity in Indonesia since the Ghozali effect arose, and the general public has begun to notice it as a viable investment choice. As a result, blockchain (NFT) literacy is rapidly expanding. The younger generation in Indonesia is becoming more involved in the NFT business, taking on roles such as NFT marketplace developer, NFT creator, and NFT management.

Keywords – Non-Fungible Tokens (NFT), Blockchain, Ghozali Effect, Cryptos, Indonesia

I. INTRODUCTION

Non-fungible tokens (NFTs) are cryptographic assets based on the blockchain that have unique identifiers and metadata that distinguish them from one another. Unlike cryptocurrencies, they cannot be sold or exchanged for equivalent. This contrasts with fungible tokens, such as cryptocurrencies, which are interchangeable and thus can be used as a medium of exchange. Non-fungible tokens (NFTs) are becoming more popular, and by 2021, they are predicted to have a significant impact on the global economy. Digital tagging for artwork, for example, is projected to be one of the NFT trends 2022, indicating a sector that will continue to grow, disrupt industries, and change our daily lives. Southeast Asian countries, particularly Indonesia, have shown a keen interest in this emerging technology.

Indonesia is debating the Non-Fungible Token, or NFT. NFT is a solution for the security of the assets, both physical and digital, according to Herry Irawan, a Research Center Researcher at Telkom University's Digital Business Ecosystem. This makes it simpler and safer to sell digital assets like NFT.

However, it is also important to consider the drawbacks of the present NFT trend, such as the sale of digital works

created by others on the NFT marketplace. In Indonesia, there are currently no regulations that particularly control NFTs. However, there are already a number of copyright or intellectual property rights (IPR) restrictions in place. Many difficulties remain in the way of this regulation's implementation, notably the difficulty of enforcing legislation in one country for violations committed by another.

Herry went on to say that, since the Ghozali effect emerged, the NFT trend has grown in popularity in Indonesia, and the public has begun to notice it as a beneficial investment option. Blockchain (NFT) literacy is fast increasing as a result of this. On the NFT marketplace, NFT creators have a big potential to sell their work. Herry also encourages Indonesia's younger generation to get involved in the NFT industry by taking on responsibilities such as NFT marketplace developer, NFT creator, and NFT manager.

Ghozali made headlines because the price of his selfies sold in NFT has risen dramatically. Indonesians have come to try their fortunes by selling diverse images as NFT once the Ghozali phenomena went popular. They, like Ghozali, decided to sell it on OpenSea, a global NFT marketplace. Unfortunately, because the general public currently has a poor grasp of NFT, digital photographs such as birthday cards are being utilized as NFT assets and sold. Despite the fact that this activity is illegal because it involves personal information.

Paintings, designs, music, films, and a variety of other digitized art goods can all be made using NFT. The NFT industry has a lot of potential, but creating a potential NFT for sale requires extensive market analysis.

The paper aims to examine the NFT trends, its development and ecosystem in Indonesia, with the following research questions:

1. What are the current trends in Indonesia for non-fungible tokens (NFTs)?
2. How the concept of NFT developed in Indonesia and what is its ecosystem?

II. LITERATURE REVIEW

According to Nadini, Alessandretti, and Di Giacinto (2021), Non-fungible Tokens (NFTs) are digital assets that

represent things like art, collectibles, and in-game items. They're usually kept in smart contracts on a blockchain and traded online, most commonly with bitcoin. They believe that public interest in NFTs peaked in 2021, with record purchases, but that little is known about the industry's overall structure and evolution. Between June 23, 2017, and April 27, 2021, the researchers examined data from the Ethereum and WAX blockchains, which comprised 6.1 million transactions involving 4.7 million NFTs. They started by outlining the statistical characteristics of the market. Second, they build a network of interactions, indicating that traders specialize in NFTs linked to comparable products and form tight clusters with other traders trading the same objects. Third, they group things related to NFTs based on their visual characteristics, demonstrating that collections comprise visually uniform objects. Finally, they investigate the predictability of NFT sales using simple machine learning approaches, discovering that selling history and, secondarily, visual features are strong price predictors. They believe that this research will lead to future research into NFT creation, adoption, and trading in a variety of scenarios (Nadini, Alessandretti, & Di Giacinto, 2021).

The principles of blockchain technology are explained by Ali and Bagui (2021). Their study goes through the benefits of NFTs as well as the future use of the Ethereum blockchain. Data blocks are the foundation of blockchain technology, which is considered one of the most secure ways to keep data safe (p. 50). Blockchain technology is a fast, open, low-cost, easy-to-use, transparent, and programmable system that enables the instantaneous movement of data and/or financial assets from one location to another. It's a protocol that establishes the rules and regulations that govern the exchange of value. The technology's safety is determined by the qualities of the chains that connect the blocks. The preceding block's hash is calculated and utilized as part of the data for the next block in the chain to be added (p. 50). ERC-20 defines fungible tokens as having a property that makes each token the same kind and value as another token. The ERC-20 standard is one of the most prominent standards that contributed to the development of NFTs (p. 54). ERC-721 Non-fungible Token Standard (Ethereum Request for Comments 721) ERC-721 provides an API for tokens in Smart Contracts. This is a free open standard on the Ethereum blockchain that allows the production of non-fungible or unique tokens. ERC-721 extends the common interface for tokens with additional functionality, resulting in non-fungible tokens. These one-of-a-kind tokens were awarded NFTs. NFTs are the best approach to identify anything or someone that isn't interchangeable because they can't be exchanged for like-for-like objects. This type of token can be used on platforms that, among other things, sell collectibles, access keys, lottery tickets, and

numbered seats at concerts or sporting events. When someone buys one of these one-of-a-kind items, they can use these NFTs to prove ownership. Because each token has only one unique attribute and is unlike any other NFT on the market, NFTs ensure uniqueness. Furthermore, at any given time, there is only one official owner, and ownership is safeguarded by the Ethereum blockchain, which assures that no one can alter the ownership record or establish a new NFT (Ali & Bagui, 2021, p. 54).

Karandikar, Chakravorty, and Rong (2021) suggest a blockchain-based system for energy asset transactions involving prosumers, electric vehicles, power companies, and storage providers in their paper. Two versions of the system were created with Hyperledger Fabric. Non-fungible tokens (NFT) are assets that have a unique identification or information in addition to value, whereas fungible tokens just have value. They devised token lifetime management algorithms, investigated their difficulties, and tested them in smart contracts. The results demonstrate that the two implementations perform similarly for the vast majority of key tasks. They also compared the use cases, design, performance, benefits, and downsides of NFT implementations. They were able to reach a throughput of 448.3 transactions per second for the slowest process, while having a rather small infrastructure (Karandikar, Chakravorty, & Rong, 2021).

In his work, Okonkwo (2021) discusses the relationship between NFT and copyright, as well as the potential difficulties and remedies, and how NFTs might be used to commercialize intellectual property. According to the researcher, disruptive technologies have broadened the horizon of possibility for intellectual property owners. The idea of selling copyrighted works digitally and then using the earnings to establish a digital currency is groundbreaking. This is one of the benefits of the Non-Fungible Token (NFT). However, this disruptiveness raises certain concerns, bringing the question of whether NFTs are a kind of intellectual property, or whether NFTs would alter the current copyright law paradigm. Governments, through her agencies, are likewise torn between trying to figure out what NFT is and whether it has any value for intellectual property (Okonkwo, 2021).

Noor (2021) in his study examines the NFT concept and how it works, as well as how it relates to the field of archiving. The researcher uses the method of literature study and observation since NFT in the field of archives is yet incredibly limited to be explored. NFTs are well recognized for their ability to be utilized in archive management in a variety of ways, such as the use of ownership certificates in the form of a collection of code that runs on a blockchain platform and can be applied to a wide range of elements and spheres of life. In addition, the NFT gives digital art supporters the opportunity to launch

their own businesses. Several obstructions or challenges may render NFTs unsustainable because to the large need for computer power and electricity, as well as their extremely fluctuating value (p. 223). The advantage of digital archives is that they are easy to reproduce. It's been tough to market digital works in the same way that conventional forms, such as paintings, have been difficult to sell. Because of the advancement of blockchain and cryptocurrencies, this is now achievable. The NFT (non-fungible token) enables the blockchain network to sell digital archives (Noor, 2021)

According to Schrader-Rank (2021) non-fungible tokens (NFTs) will have an exponential impact on the general public, and notably the art market, due to three factors. The first is the scarcity mindset, which is responsible for a person's sense of urgency for a certain commodity. The second point to explore is how NFTs might be used in real-world applications or across the economy. The appeal of NFTs is that they are nondiscriminatory, allowing people from all walks of life to participate. NFTs appear to be an excellent investment as scarcity appears to be increasing. The researcher investigates the physical effects of NFTs on the environment. When compared to paper money exchanged for a piece of actual artwork in a real setting, virtual 'tokens' used to fund digital art are theoretically significantly less detrimental to society (p. 1) Schrader-Rank (2021) performed a six-month examination from May to October 2021, using practice-led research, to reveal the true consequences of NFTs on the globe. The evidence obtained by the researcher is meant to assist others in grasping the fundamentals of art. According to the researcher, it is critical to educate individuals about the impact of NFTs on the arts, especially since they are still in their early stages of development (Schrader-Rank, 2021).

III. RESULTS AND DISCUSSIONS

The adoption of blockchain in Indonesia is influenced by global developments in this sector (Hadjanto, 2022). The Indonesian people's expectations of blockchain were still particular as a traditional financial service solution in the start of its development phase. Internal and external factors also contribute to these expectations. The internal aspect stems from the development of blockchain, which is still mostly focused on financial sector applications, while the external factor stems from numerous media headlines that concurrently expose Bitcoin and blockchain. Although this is typical, the conflation between Bitcoin with blockchain can lead to societal misunderstandings. Furthermore, the Indonesian people's expectations about blockchain are still negative. This is largely due to the media's widespread coverage of the rising habit of exploiting Bitcoin for criminal transactions. The Indonesian government was forced to interfere as a result

of these negative expectations. To protect the public, the Financial Services Authority (OJK) has suspended various crypto currency transaction activities (Financial Services Authority, 2017a)

Bank Indonesia (BI) is also involved in the Indonesian Blockchain 1.0 development. The use of cryptocurrency is forbidden in Indonesia, according to BI. This is in accordance with Law No. 7 of 2011 on Currency, Bank Indonesia Regulation (PBI) No 18/40/PBI2016 on Payment Transaction Processing, and Bank Indonesia Regulation (PBI) No 19/12/PBI/2017 on Financial Technology, all of which state that Rupiah must be used for financial transactions within the Unitary State of the Republic of Indonesia (NKRI). Furthermore, BI forbids the use of cryptocurrencies because they are extremely dangerous, volatile, and lack a governing body. As a result, Bank Indonesia believes that cryptocurrency could be used for unlawful purposes like money laundering and terrorism financing.

Payment mechanisms, particularly those connected to blockchain technology, remain one of the major roadblocks to the digital economy's expansion. That's because cryptocurrency is still a contentious topic in Indonesia. Taxes are one aspect of blockchain technology that is at the base of all issues. The sale of Ghazali's selfie images is an example. Others argue that Ghazali is obligated to pay taxes (Hadjanto, 2022)

Statista conducted a global study on cryptocurrency adoption in 55 nations in 2020, with between 2,000 and 12,000 respondents per country. Researchers discovered that with 21.1 percent of respondents saying they own or use cryptocurrency, Vietnam came in second. The Philippines came in third place with 19.8%, Thailand in fifth place with 17.6%, Indonesia in tenth place with 13%, and Malaysia in twelfth place with 12.3%. According to Triple-A, a cryptocurrency payments provider, there were more than 300 million cryptocurrency users globally in 2021, with a 3.9 percent ownership rate. Asia accounted for 160 million users, with Southeast Asian countries like Indonesia accounting for more than 7 million. Over 21 million people in Southeast Asia used cryptocurrencies.

The region's strong rate of cryptocurrency adoption and a global spike in NFT sales in the third quarter of last year indicate that the crypto market is ready for investment. Getting information on cryptocurrencies, NFTs, and DeFi in their native languages will go a long way toward dispelling myths and increasing NFT adoption and cryptocurrency usage among Southeast Asians.

According to the Finder survey, NFT adoption in Southeast Asia is stronger, with a higher percentage of adults in the region knowing what NFTs are, than in places like Japan,

where 90% of individuals believe they are unaware of non-fungible tokens. Surprisingly, countries like the United Kingdom and the United States score poorly, with 78.8% and 70.6 percent, respectively, admitting they are unaware of NFTs.

Despite the existing limits on the use of cryptocurrencies/virtual currencies as payment instruments, the laws and regulations in Indonesia largely allow for crypto trading operations (Situmorang & Putri, 2022). With the current popularity of Non-Fungible-Tokens 'NFT', Indonesians are becoming more interested in crypto assets. The legality is a hot topic of discussion, and many people want to know more.

Crypto assets in Indonesia are governed by the following rules:

- a. MoT Regulation 99/2018 for Crypto Asset Future Trading;
- b. BAPPEBTI Regulation No. 8 of 2021 on Guidelines for Physical Market Trading of Crypto Assets on Futures Exchanges ("BAPPEBTI Regulation 8/2021") and
- c. BAPPEBTI Regulation No. 7 of 2021 on Decree on the List of Tradeable Crypto Assets in the Crypto Asset Trading Market.

As defined in Art. 1 Point 7 of BAPPEBTI Regulation 8/2021, crypto assets are intangible commodities in digital form that use encryption, information technology networks, and distributed ledgers to govern the production of new units, verify transactions, and secure transactions without the interference of third parties.

Given the high volume of Crypto Assets exchanges in Indonesia, the government aims to construct a centralized Futures Exchange, as there are now no Futures Exchange facilities for Crypto Assets trading (Situmorang & Putri, 2022). In terms of NFT, despite the fact that there is a lot of interest in this area, it is still unregulated, the current restrictions on Crypto Assets will apply to NFT market operations. The licensing standards for Crypto Assets exchange activities should be followed by the NFT marketplace. This will continue to be the case as long as the Indonesian government/BAPPEBTI has not implemented any explicit NFT regulations.

In Indonesia, non-fungible tokens, or NFTs, have become a popular fad (Effendi, 2022). Baduy, a local artist, created digital artwork depicting a Baduy tribal member, which is currently available as an NFT on opensea.io for 0.01 ETH. Syahrini and The Goods Dept. followed suit, releasing their own lifestyle-themed NFTs.

The fast proliferation of NFTs in Indonesia has forced the country's legal authorities to increase their efforts to recognize the distinctive properties of these digital tokens. NFTs, on the other hand, are not yet regulated in Indonesia due to the existing regulatory position of crypto assets. Because their value is not established by the market, they are not classified as cryptocurrencies. Existing laws and regulations accept the use of blockchain technology. The numerous activities connected to fund-lending are likewise recognized in the various activities in the Indonesian standard industrial business categorization code.

NFTs have a role in the digital economy in Indonesia as well. By 2021, Indonesia is predicted to have six NFT marketplaces. The companies involved are TokoMall, paras.id, Enevti, Kolektibel, Baliola, and Artsky. The number is insignificant when compared to other e-commerce marketplaces in the country. However, because NFT is still in its early stages, there is still room for improvement.

In Indonesia, the majority of digital businesses must adhere to a number of legal requirements. Electronic system suppliers, for example, must register as system providers. Digital and electronic platforms operating in Indonesia must register their entity and server location in addition to registering with the appropriate authorities. Taxes are also levied on digital items. How NFTs will be controlled in the future is still unknown.

There are currently no particular regulations in place in Indonesia's tax legislation regarding blockchain technology (Cekindo, 2022). Because NFTs have a non-fungible property, it is difficult to classify them into a specific group. Because Indonesian banks only accept the rupiah as a form of payment, cryptocurrencies used for trading NFTs fall into a grey area of legal difficulties. The applicable laws for NFT transactions are hazy in a decentralized NFT marketplace. This creates apparent potential for international arthouses, artists, and any other type of digital creative to prosper in the Indonesian market, which is notoriously difficult to navigate. Big tech and digital enterprises can conduct early activities in Indonesia, even after having to deal with various regulatory obligations such as tax obligations or onerous business registrations, with the help of appropriate communities and the freedom provided by blockchain technology.

It would be foolish to ignore the aforementioned restrictions in light of the digital economy's rapid growth. However, given a company's business potential, having a local organization assist with business activities is highly recommended. When it comes to starting a business in Indonesia, using such a scenario would put organizations in the early adopter's stage.

Due to the epidemic, a group of 64 local and international artists, galleries, and curators in Indonesia have banded together to present Art Moments Jakarta, the first art exhibition to take a hybrid live-online format (Katherine, 2021). Art Moments Jakarta is supporting the NFT art scene, thanks to technological advancements sparked by the pandemic. The Ministry of Tourism and Creative Economy is also a sponsor of the event. In today's digitized environment, Indonesians are swiftly recognizing the authenticity and validity of NFTs. In the blockchain ecosystem, it has the same value as a land certificate because it was created by people for people.

Within the creative and entertainment industries, there is still room to make an impact and promote platforms that function on the Proof of Stake network. Hic et Nunc is home to a thriving, international community of artists and creators. The platform, which debuted in March 2021, topped 100,000 NFTs created in May (a monthly average of 35,000 NFTs), with over 2 million NFTs bought and resold. It recently surpassed OpenSea, one of the most popular Ethereum-based NFT exchanges, in terms of daily active users. Clean NFTs with a lesser carbon footprint are the favored option as producers and purchasers become more eco-conscious.

Indonesia is steadily progressing in the direction of digital network platforms. MetaRupa.com, an open-world virtual realm (or "Metaverse") exhibition place, will launch in the country soon (Katherine, 2021).

IV. CONCLUSIONS

NFTs (non-fungible tokens) are blockchain-based cryptographic assets that cannot be sold or traded for cash. These tokens are becoming more popular in Indonesia, and by 2022, they are predicted to have a significant impact on the worldwide economy. It will continue to expand, disrupt industries, and transform our everyday lives. This developing technology has piqued the curiosity of Southeast Asian countries, particularly Indonesia. The Non-Fungible Token, or NFT, is being debated in Indonesia. NFT is a solution for the physical and digital protection of assets. There are presently no regulations in place in Indonesia that specifically regulate NFTs. However, a lot of copyright and intellectual property rights (IPR) restrictions already exist. In reality, many obstacles remain in the way of this regulation's execution, the most significant of which being the difficulty of executing legislation in one country for violations committed in another.

The NFT trend has risen in popularity in Indonesia since the Ghozali effect arose, and the general public has begun to notice it as a viable investment choice. As a result, blockchain (NFT) literacy is rapidly expanding. The younger generation in Indonesia is becoming more involved in the

NFT business, taking on roles such as NFT marketplace developer, NFT creator, and NFT management. When the Ghozali phenomenon became widespread, Indonesians decided to try their luck by selling various photos as NFT. They planned to offer it on OpenSea, a global NFT marketplace, just like Ghozali. Digital images are being used as non-financial assets (NFTs) and sold. Despite the fact that this behavior is unlawful due to the personal data involved.

According to Bank Indonesia, the use of bitcoin and NFTs is prohibited in Indonesia. This is in line with Law No. 7 of 2011 on Currency, Bank Indonesia Regulation (PBI) No 18/40/PBI/2016 on Payment Transaction Processing, and Bank Indonesia Regulation (PBI) No 19/12/PBI/2017 on Financial Technology, which all state that Rupiah must be used for financial transactions within the Unitary State of the Republic of Indonesia (NKRI). Furthermore, because cryptocurrencies and NFTs are exceedingly risky, volatile, and without a controlling body, Bank Indonesia prohibits their use. As a result, Bank Indonesia fears that these assets could be utilized for illegal activities such as money laundering and terrorism financing.

According to Statista's global assessment on cryptocurrency usage in 55 countries in 2020, Indonesia ranks tenth with 13 percent adoption of cryptocurrencies and NFTs. More than 7 million people in Indonesia use the service. Moments of Art Thanks to technological developments triggered by the pandemic, Jakarta is supporting the NFT art scene. Indonesia's Ministry of Tourism and Creative Economy is also supporting the event. Indonesians are quickly realizing the authenticity and validity of NFTs in today's computerized world.

Due to the current regulatory status of crypto assets, NFTs are not currently regulated in Indonesia. They are not classified as cryptocurrencies because their worth is not determined by the market. The use of blockchain technology is permitted under existing laws and regulations.

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