INTEGRATION OF KANO MODEL AND QUALITY FUNCTION DEPLOYMENT FOR IMPROVING CUSTOMER SATISFACTION IN CO-WORKING SPACE DESIGN

(*Case study: PT. PERTAMINA EP (PEP) SANGASANGA FIELD*)

THESIS

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INTERNATIONAL UNDERGRADUATE PROGRAM

IN INDUSTRIAL ENGINEERING

FACULTY OF INDUSTRIAL TECHNOLOGY

UNIVERSITAS ISLAM INDONESIA

YOGYAKARTA

2023

SUPERVISOR APPROVAL SHEET

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Yogyakarta, August 19th 2023

Supervisor,

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EXAMINERS' APPROVAL PAGE

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UNDERGRADUATE THESIS

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Yogyakarta, August *19th 2023*

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ABSTRACT

Customer satisfaction is described as the way a person feels a product or service performed in comparison to his or her expectations. Additionally, service-related activities play a vital role in fostering organizational expertise and bringing together the organization's network of people, technologies, and information to produce value for customers and stakeholders. Therefore, it is essential for all firms to comprehend customer needs and satisfy them. This study attempts to describe how quality function deployment is used to improve customer satisfaction in coworking space design within an enterprise. The design framework, which strategically outlines the necessary facilities and advised services in the co-working space, is the expected outcome of the research. The oil and gas state enterprise in Indonesia is the organization that was the subject of this research study. First, an online survey asking employees about their opinions on having a co-working area in their company and what facilities should be offered is undertaken to determine what the employees need. Then, utilizing the house of quality, the kano model and the quality function deployment principle are combined. The preference of each employee requirement is translated into importance weight, as well as the relationship matrix, defined in the house of quality. Following the specification of k-value and importance weight, the technical requirements are divided into four categories in accordance with the Kano model of customer satisfaction. The adjusted importance weight is then determined by multiplying the original importance weight by the k-value. The facilities and services design and the rating of each element's importance are summarized at the conclusion of the study and presented as a conceptual design for the creation of coworking space within the business.

***Keyword**: Quality Function Deployment, Kano Model, coworking space, customer satisfaction*

STATEMENT OF ACADEMIC INTEGRITY

In the name of Allah, I declare that this research is a work based on research that I did by myself except for the citations and summaries that have their sources listed. If in the future, this research is proven to violate the rules and intellectual property rights, I am willing to accept the sanctions by universitas Islam Indonesia.

Yogyakarta, 16 August 2023

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ACKNOWLEDGEMENT

This thesis project's success is partaken by a number of persons. First of all, I would like to thank Mr. Ir. Muhammad Ridwan Andi Purnomo, S.T., M.Sc., Ph.D., my supervisor and the head of the department, for his support and direction during the research project.

Secondly, I would like to thank Dr. Agus Mansur, S.T., M.Eng.Sc., and Dr. Drs. Imam Djati Widodo, M.Eng.Sc. as the thesis examiners, for their insightful counsel during the proposal and final thesis assessment stages.

Thirdly, I would like to thank all employees of PT. Pertamina EP Sangasanga Field for their aid and support on the insight information on the organization and its people.

Fourthly, I would like to express thanks to my colleague Miss Rahma Alrosdi Wira Putri, for her outstanding assistance and advise.

Lastly, I would like to thank my parents, relatives, friends and all others who encouraged and guided me throughout this research.

Tika Warisman

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Chapter 1 Introduction

This chapter serves as the introduction to the research project and covers the needs to establish the research, the importance of the research area, the background of the organization involved in this research, and an overview of the problem statement for the research. It also includes the development of the research hypothesis, the research objective, the scope of the research, and the expected results.

1.1 General Broad View of The Research Area

In today's modern era, the quality of life is not only defined by material standards but also includes various intangible values that are primarily service-oriented. Different from physical products, the value of services is largely subjective. The outcomes of services will determine the customer's satisfaction, they are measured using social and perceptual measures, such as success, happiness, satisfaction and similar concepts while manufacturing is associated with physical and functional features (Qiu, 2014). In order to produce value for costumers and stakeholders, it is important for service providers to bring together people, technologies, and information. This can be accomplished through the use of Service Science. "Service science" is a field of study that combines engineering and management. Service science integrates study, analysis and design to improve service systems (Lin, Maglio & Shaw, 2014). The difficulty for any service business is to thrive in this fast-expanding world and survive in the era of dynamic business, where intense competition exists across all industries. Since the development of service systems results from a shift in people's attitudes and behaviors, it is crucial for the business to understand customer needs and effectively fulfill them. So, service management and design are extra crucial strategies for enhancing an organization's ability to compete in this challenging environment.

The improvement of procedures, including the use of technologies and supportive infrastructure, could be used to carry out the service systems and operation. Additionally, the improvement of the value cocreation among stakeholders is important. Qiu (2014) stated that the service's focus is people-centric. It means the service business process is dealing with people's physical and mental needs, involving both service providers and customers in pursuit of excellent user experience and satisfaction.

It is no doubt that we are in a disruptive era where these improvements and technology are continuously growing at an unpredicted rate. Additionally, new working trends like flexibility and mobility in the workplace as well as global connectivity have an impact on the future working environment. As generation Z enters the workforce, the ratio of generations is changing. This causes the nature of entry-level jobs to shift. Many businesses today want their entry-level employees to work with data, do research, and make innovations using cutting-edge technologies. To face this situation, it is required to have the ability to think critically and creatively, as well as to truly understand human behavior by analyzing customers' journeys. The company must therefore anticipate new trends and offer appropriate strategies for the future to further encourage employees to multitask. The continuous stream of new product or service improvement will be achieved by continuous redesign of the business, whether its products or services, listening to your consumers, keeping an eye on your competitors, and being aware of inventions and upcoming technologies (Trott, 2008).

1.2 How the Research Fits into The Field

Recent Trends in Workplace

The company must constantly encourage information sharing among groups of employees, take advantage of new emerging trends, and put more emphasis on the requirements and interests of each individual.

Table 1.1. Top Workplace Trends by Forbes

Forbes Top 10 HR Trends That Matter Most In The 2020 Workplace	
Position	
1	Start with focusing on worker wellbeing
2	Prepare for humans + bots as the new blended workforce
3	Look for new use cases of AI 4 HR
4	Focus on building ethical AI
5	Consider soft skills to be power skills in 2020
6	Audit your workplace environment for physical, emotional, and environmental attributes
7	Explore virtual reality for corporate training
8	Re-define blended learning to include on-demand coaching
9	Recruit for skills rather than college pedigree
10	Make your workplace experience a top priority

Source: Retrieved from Meister (2020)

Most trends in 2020 are moving toward improving the work environment, work-life balance, and skills. Benitez-Marquez et.al (2022) stated that more businesses are allocating resources to take care of and motivate their internal customers, which are internal employees.

Despite not being the organization's primary source of revenue like external customers, those who make purchases of its goods or services, Internal customers, on the other hand, are individuals who have a relationship with the company, such as owners and employees, the internal customer provides benefits for the company. A study by Conduit et al. (2014), suggests that paying attention to internal customer orientation can help the organization improve performance that leads to success.

The majority of businesses are boosting their competitiveness by paying attention to excellent workspaces that meet employee's needs in an effort to deliver positive user experiences. Organizations are strategically rethinking their workplaces to align with their fundamental values. In addition, there are five factors that influence how business align their workspace with their culture are listed as (1) driving culture, (2) enabling choice, (3) promoting wellness in the workplace, (4) enhancing engagement, and (5) nurturing community values (Lockaby, 2016).

About the Researched Organization

Pertamina EP (PEP) Sangasanga Field is a subsidiary of Pertamina Hulu Indonesia (PHI) which manages upstream oil and gas operations and business according to ESG (Environment, Social, Governance) principles. PEP Sangasanga Field is managing upstream oil and gas production through exploration and exploitation activities in the work area. PEP Sangasanga Field is located in Sangasanga, Kutai Kartanegara district, East Kalimantan. Over twenty years, PEP Sangasanga Field has been alongside our nation in maintaining a supply of oil and gas, creating innovations, boosting the economy, and enhancing people's quality of life.

According to the vision of "To become a world-class oil and gas exploration and production company" and the mission "Carry out the business of upstream oil and gas sector with an emphasis on commercial aspects and good operations and grow and develop with the environment" the organization considers both the use of research and the implementation of innovations and technology to be essentials (Pertamina EP, 2020).

It could be said that Pertamina EP Sangasanga Field is one of the large organizations run in East Kalimantan. Due to the hierarchies in the company's

organization, Pertamina EP Sangasanga Field's working process is not as fluid and agile as it should be, given the large number of employee and numerous numbers of departments, it can result in the authority's limited capabilities, internal conflicts, and slow response to the most recent emergent trends.

PT. Pertamina EP Sangasanga Field approximately has 560 employees. Pertamina EP defines "ENTROPY" as the energy used for unproductive activities in a work environment. Entropy shoes the level of conflict, friction, and frustration in the environment. According to their Entropy Data in 2019, shows the problems exist in their working system. Based on the interview: "Biggest aspect that has the highest entropy is bureaucracy. It feels like there is "distance", "complicated working process". There is a gap that is felt by younger employees, as if being "unnoticed" by the older employees.

Table 1.2. Entropi Data (PEP Sangasanga Field, 2019)

LEVEL	NILAI YANG MUNGKIN MEMBATASI	VOTES PER NILAI	% ENTROPI PER NILAI	VOTES PER LEVEL	% ENTROPI PER LEVEL
3	Birokrasi	70	15.28%	158	3.45%
	Kebingungan	23	5.02%		
	Kekuasaan	16	3.49%		
	Lembur	30	6.55%		
	Menahan Informasi	8	1.75%		
	Menunda	4	0.87%		
	Silo	7	1.53%		
2	Konflik Kepentingan	16	3.49%	53	1.16%
	Manipulasi	6	1.31%		
	Pencitraan Diri	14	3.06%		
	Persaingan Internal	13	2.84%		
	Sifat Menyalahkan	4	0.87%		
1	Fokus Jangka Pendek	51	11.14%	179	3.91%
	Kontrol	44	9.61%		
	Melempar Tanggung Jawab	15	3.28%		
	Menghindari Resiko	29	6.33%		
	Pengurangan Biaya	40	8.73%		
TOTAL	390	DARI	4580	8.52%	

Nilai yang Membatasi (Skor diatas 10%)

1	Birokrasi	15.28%
2	Fokus Jangka Pendek	11.14%

KETERANGAN :

> 41%	SITUASI KRITIS
31% - 40%	SANGAT TIDAK SEHAT
21% - 30%	TIDAK SEHAT
11% - 20%	KURANG SEHAT
0% - 10%	SEHAT

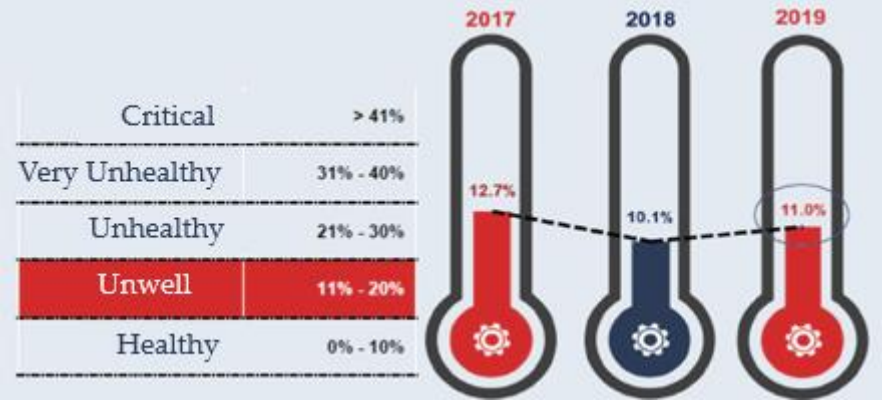


Figure 1.1 Current Entropy Condition of PEP Sangasanga Field

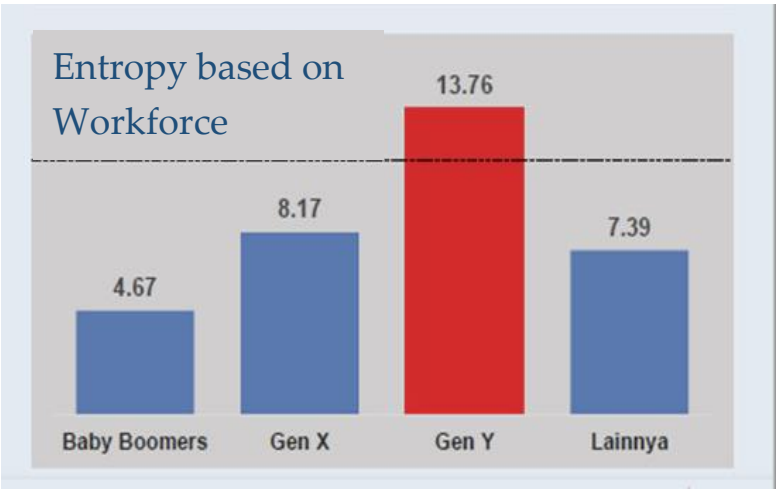


Figure 1.2 Entropi Data Based on Workforce Age (PEP Sangasanga Field, 2019)

According to their Entropi Data, due to the complicated bureaucratic working process, and short-term focus on their employees, employee performance within PEP Sangasanga Field has been disrupted. Additionally, based on the interview, there is a generation gap conflict going on in the workplace. It is triggered by the existence of various combinations of generations in the organization. Employees often find that they have different attitudes and behavior in the workplace. Older generations tend to be more traditional, while younger generations are looser and more spontaneous around time and place. This generation gap conflict will certainly have an impact on employee performance. Hence, it is important for PEP Sangasanga Field to deliver an effective

strategy to improve their employee's work performance. Delivering supportive programs intended to improve employee's performance and broaden their skill sets in order to take advantage of emerging opportunities. The divisions need to implement co-creation to include all stakeholders in moving the organization toward its objectives. One of the most important factors in maximizing both organization's and its employee's potential is a good workplace with good service that will improve employee satisfaction. By providing a good service, it reflects of how well a company meets the requirements and expectations of its customers.

To become the leader in the oil and gas industry, PEP Sangasanga Field implements six supporting core values, which are A: Amanah (Trust), K: Kompeten (Competent), H: Harmonis (Harmony), L: Loyal, A: Adaptive and K: Kolaboratif (Collaborative). These elements must be in line with the organization's vision, which is to become a world-class oil and gas exploration and production company.

Figure 1.3 AKHLAK Core Values of PEP Sangasanga Field

All PEP employee strongly agrees with the vision, strategy, and fundamental values in order to adapt to changes and support future missions.

Even if PT. Pertamina EP's performance is among the best of all state-owned businesses, continuous improvement is always taken into consideration in order to achieve the goal of their Continuous Improvement Program (CIP), which is to advance the nation's oil and gas production and sustainability. The company has the chance to make the most of its resources, increase employee engagement, and maximize each employee's potential in order to jointly produce beneficial results for the company. The company may also offer its important employees a motivating work environment, helpful technology, and a well thought-back operation at the same time in accordance with one of their core values which is Collaborative. This takes the shape of an internal organization co-working space or a corporate co-working space.

1.3 Research Question

This study seeks to provide a solution to the questions, "What facilities should be offered in co-working spaces in a state enterprise, PT. Pertamina EP Sangasanga Field, and what are the recommended services in order to strategically fit the needs of the employees and the current trends"

1.4 Research Hypothesis

To support the previously mentioned questions, the following hypothesis is developed: "By renovating the organization's available space, the design of co-

working space service quality is successfully improved in accordance with the employee requirements and meets their expectations”

1.5 Research Objective

The purpose of this study is to:

1. Identify facilities that should be offered in co-working spaces in state enterprise such as PT. Pertamina EP Sangasanga Field?
2. Identify the suggested services for co-working spaces in order to strategically fit into the needs of employees of PT. Pertamina EP Sangasanga Field and meet the current trends.

1.6 Scope of the Research

This research focuses on improving service quality in the design of co-working spaces in one of the stated-owned enterprises, PT. Pertamina EP Sangasanga Field. In this research, the suggested interior layout and operation management will be introduced according to customer opinions, which will lead to further improvement of service quality.

1.7 Expected Outcomes and Benefits

The predicted results and benefits are summed up as follows:

- An understanding of the needs of the employee of PT. Pertamina EP Sangasanga Field

- The suggested layout for the organization’s co-working space.
- The successful strategy for providing better service for the company’s internal customers.
- Improvement of customer satisfaction for the existing training center through the establishment of co-working spaces through recommended concept design and service delivery.

Chapter 2 Review of Literature

This chapter summarizes the literature that has been published on a variety of topics, including (1) an overview of the organization used in the study, (2) the value of good workplace infrastructure, (3) coworking spaces within organizations, (4) customer journey maps, (5) the Kano's Method (6) the Quality Function Deployment (QFD), and (7) the House of Quality (HOQ).

2.1 PT. Pertamina EP Sangasanga Field Overview

Pertamina Ekspolasi Produksi (PEP) Sangasanga Field is an Indonesian state-owned company (BUMN) that is operating in field of oil and gas industry. PEP Asset 5 oversees five working areas including Sangasanga Field. Since its founding in October 2008, PEP Sangasanga Field has been among the nation's top oil and gas producers. Exploration for the search for new oil and gas, exploitation, including production operations and distributing the oil and gas are three main business activities of PEP Sangasanga Field. They get the task of managing the working area of 5325.5 Ha. At the end of 2022, the production performance in PEP Sangasanga Field reached 4777 Barrels of Oil Per Day (BOPD) and 3.68 Million Standard Cubic Feet per Day (MMSCFD). As for operation performance, PEP Sangasanga field successfully operated 139 active wells and carried out maintenance with 99.45% Reliability and 98.65% Availability (Pertamina EP, 2022).

PEP, which is the main oil and gas producer also offers a bidding system called Kerja Sama Operasi (KSO). KSO's partner is called Technical Assistance Contract (TAC). It is hoped that many potential investors will be interested in partnering with PT Pertamina EP to develop an oil and gas exploration area. In PEP Sangasanga Field, the oil and gas both from their own operation and neighborhood TAC

are distributed to the Pertamina RUV Balikpapan oil refinery and to the Perusahaan Listrik Negara (PLN) PLTG Tanjung Batu. Oil is shipped using barging vessels and gas is distributed using pipelines. Figure 2.1 simplifies the structural flow of business activities in PEP Sangasanga Field.

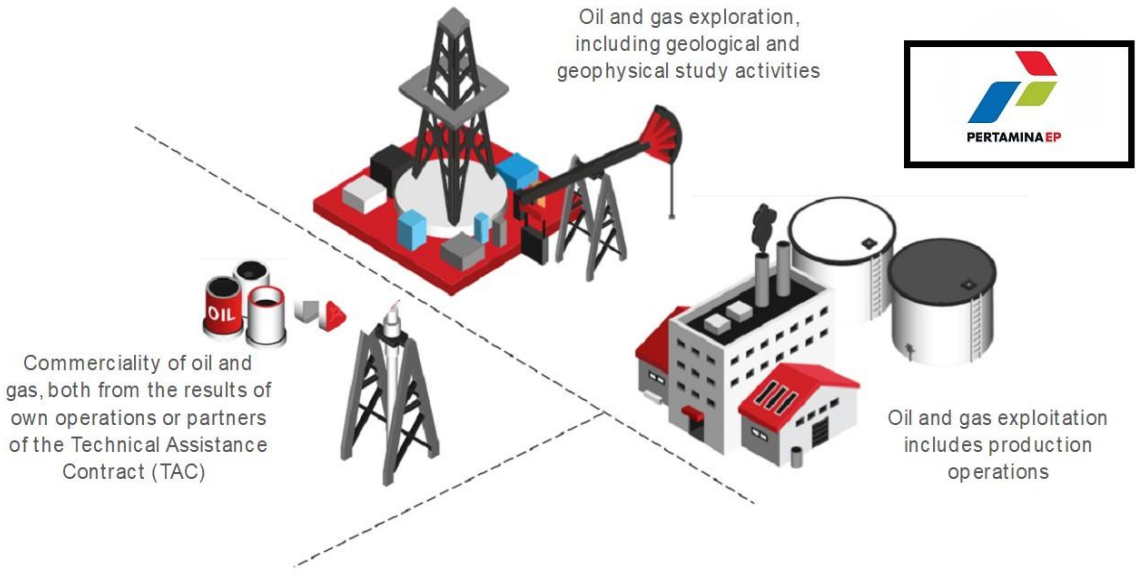


Figure 2.1 PEP Sangasanga Field Business Workflow

Figure 1.2 displays an organizational chart for PEP Sangasanga Field. Currently, in PEP Sangasanga Field there are 460 employees.

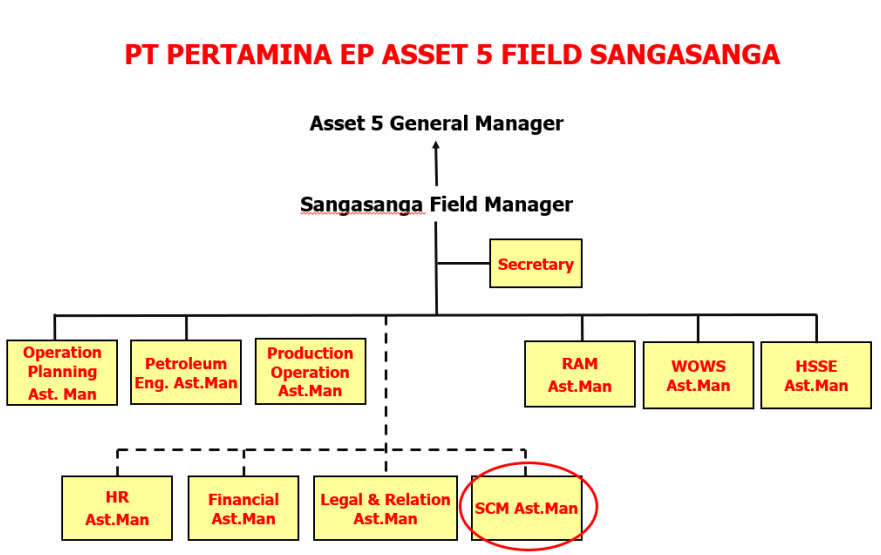


Figure 2.2. PT Pertamina EP Sangasanga Field ‘s Organizational Chart

In addition to operating the core business of oil and gas exploration, exploitation and production, PEP Sangasanga Field also manages other service operations for the state-owned electric industry, such as turbine engine operation assistance, and increasing electrification ratio for neighborhood in Kalimantan Timur areas that have not yet had electricity. Additionally, PEP Asset 5 seeks national energy needs by exploring and producing oil and gas in the Kalimantan region. PEP Asset 5's operating areas include East Kalimantan (Sangasanga and Sangatta), North Kalimantan (Tarakan and Bunyu), and Central Kalimantan and South Kalimantan (Tanjung). As much as 30% of PEP Asset 5's total oil and gas production is contributed by the PEP Sangasanga Field.

2.1.1 Competitive Business Position

Table 2.1 below describes the external and internal factors that have an impact on how PEP Sangasanga Field operates.

Table 2.1. PEP Sangasanga Field’s SWOT Analysis

S- Strength	**W- Weakness**
○ Mature assets and field ○ Increased operation complexity ○ Reputable expertise and experience ○ High-skilled employees from a variety of backgrounds ○ Knowledge management is available	○ Increase operation cost due to complexity ○ Conflicts between and within divisions are led by the employee’s generation gap. ○ Lack of internal employee collaboration

○ More employees from the young generation are hired into the organization ○ Own a large number of assets, such as working field, employees, pipeline network, rigs, wells, power plants, and tank	○ Complicated bureaucratic working procedures ○ High operational cost ○ Outdated working environment and slow response to emerging trends and technology ○ Low productivity rate
O – Opportunity	**T- Threat**
○ PT. Pertamina EP is responsible for Production Project RJPP 2021-2026 ○ Government policy regarding free energy trading ○ The application of digital transformation, AI, and big data analytics in the energy sector ○ Being a well-recognized organization that other external authorities want to partner with ○ The emerging of new working trends ○ The Oil and gas industry will remain a multi-trillion-dollar market for decades	○ The promotional of renewable energy, solar panels, and the growth of other independent power suppliers ○ Resources uncertainty ○ Investor Skepticism ○ Negative perceptions from some local communities ○ PT. Pertamina EP is responsible for Production Project RJPP 2021-2026 ○ Technology disruption ○ Flat or declining demand ○ Intense competition in the oil and gas industry ○ Price drop

○ Development of Talent Management Program ○ Organization capabilities improvement	○ External environmental changes that have an impact on the current operation and working environment

2.1.2 PEP Field Sangasanga Demographics

The total number of employees at PEP Sangasanga Field by the end of 2022, are 560 employees in total. 125 regular employees, and 435 are *Tenaga Kerja Jasa Penunjang* (TKJP). Figure 2.1.1 shows the summary of PEP Sangasanga Field's employees broken down into categories. About 22% of the total amount are the employees who work in the Reliability Availability & Maintainability (RAM) division. The other 22% are working in Production and Operations. Health, Security, Safety, and Environment is the third largest division that has 15% of the total number of employees. In terms of employee age, the majority of the Petamina EP Sangasanga Field are generation Y at a percentage of 38%. In contrast, the lowest number of employees is generation Z at the rate of 8%. However, the generation-z will significantly increase as they are hired into the organization in the following years while the baby boomers are getting retired from the organization.

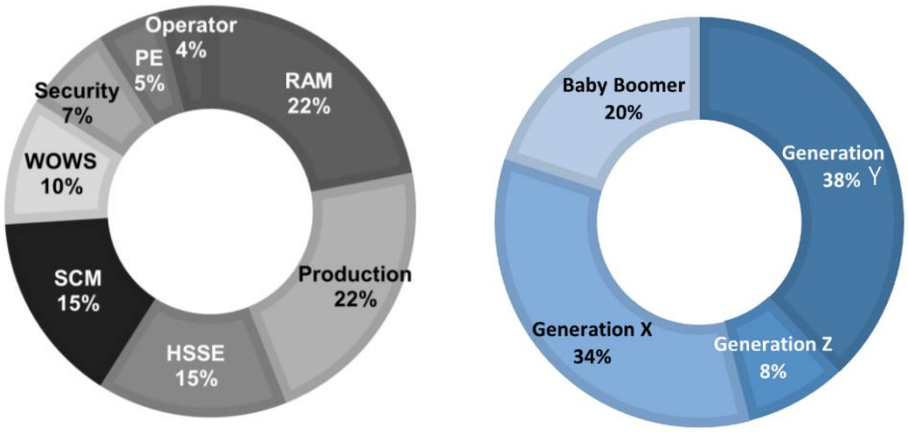


Figure 2.1. PT. Pertamina EP Sangasanga Field's Demographics (in Percentage) (Pertamina EP Sangasanga Field, 2022)

The age-based categorization of employee data is based on a percentage of current employees. Baby boomers, generation X, generation Y, and generation Z employees in the organization can be divided into four groups based on their years of birth, which are stated as 1946 to 1993, 1964 to 1978, 1979 to 1993, and 1994 to present, respectively. Almost all of the baby boomers, who make up one-fifth of the workforce, will retire within the next five years. It is assumed that the ratios of the following three generations are distributed equally in every division (Pertamina EP, 2022).

2.2 Importance of a functional workplace infrastructure

In the modern workplace, offices are where employees spend roughly half of their daily time. The four-wall infrastructure of the traditional office setting is considered outdated. Many large corporations and start-ups such as Google and Facebook, have placed a lot of emphasis on infrastructure design by concentrating on the requirements and needs of its employees. The impact of infrastructure on employees is taken into account by the businesses. A good work environment lowers employee stress and

increases productivity. In addition, replacing standard office furnishings and supplies with ones that are more comfortable for employees helps foster more innovation. The increased profitability of the company and the assurance of a happy workplace are two advantages of the previously mentioned benefits of good infrastructure. The environment and infrastructure must be created to meet everyone's demands while taking ergonomics into account. The use of vibrant wallpaper promotes improved creativity and a high-morale work environment. In conclusion, having a good workspace, furniture and office equipment is crucial for keeping the company's most precious asset, its employees satisfied (Singh et al, 2021).

2.3 Co-working Space in Organization

The first co-working space opened in the United States in 2005 as a result of population shifts in the labor market and a change in social norms (Wu, 2018). The definition of co-working space based on the definition of the Oxford Dictionary is a work or office environment that is used by people who work alone or work for different companies. Younger generations place a higher priority on unique experiences than constantly working in a rigid workplace. Additionally, they have the mindset that success is evaluated based on the output of the work rather than the overall number of hours spent at the workplace. So long as there is access to the internet, they can work wherever they want. A rising number of people are drawn to coworking spaces by the chance to exchange knowledge, and contacts. Ideas, insights, and information about the company (Cabral & Winden, 2022). A study conducted by Orel & Alonso Almeida in 2019 shows that four of six workspace user feels sharing the space leads user to participate in casual conversations and impromptu interactions. The frequent meetings,

casual conversations and impromptu interactions help build stronger network and foster a sense of community. In Indonesia, many co-working spaces are popular in several cities shown in the table below.

Table 2.2. Examples of Co-working Spaces in Indonesia

Co-working Spaces in Indonesia	
Cities	Co-working Space
Jakarta	JustCo, Gowork, CoHive, Wellspaces, Servio
Surabaya	Koridor, Satu Atap, C20 Library & Collaborative, Revio
Bandung	Eduplex, Co&Co Space, Digital Innovation Lounge (DILo), Happy CoCreative, Sans Co Space
Yogyakarta	Genius Idea, Sinergi, Antologi Collaborative Space, Ruangkerja.co, Jogja Digital Valley
Bali	Outpost, Genesis Creative Center, Biliq, Tropical Nomad, COlabo Coworking

The workplace today encourages socializing and face-to-face interaction while also being more functional and productive. Office designs must adapt to the disruptive era in order to turn the traditional organizational culture into an innovative culture that encourages collaboration. The authority requires a place for idea exchange, community building, and collaboration in addition to open-plan workplaces. Despite the fact that the phrase “co-working” was originally intended to refer to a common space for freelancers, it may be used by any business to foster innovation and creativity. It is impossible to deny that conversations and spontaneous meetings among groups of people are crucial components of effective invention, therefore businesses must create an encouraging working environment (Fuzi et al, 2014).

2.3.1 KORIDOR Co-Working Space

KORIDOR is a co-working space owned by the city government of Surabaya, East Java Province. KORIDOR is the first step to build and enhance the

creative local economy foundation (KORIDOR, 2023). As part of the vision of the Governor of Surabaya, Tri Rismaharini, to make Surabaya a creative and technological center globally. KORIDOR is a co-working space that aims to accommodate innovation and collaboration among creative young people in Surabaya. The organization is the commitment of the Surabaya City government to create an ecosystem that empowers local creators, innovators, and entrepreneurs to innovate and be able to compete who share the same passion: collaboration. KORIDOR partnered up with Google Business Group (GBG) Surabaya and the Gerakan Nasional 1000 Startup Digital. KORIDOR which is located at Siola, Tunjungan St No.1, Genteng, Surabaya, East Java offers many facilities to its customers including collaborative workspaces that are open for the public (wide: 177m2), event rooms (wide: 128.8m2), meeting rooms, gathering rooms (wide: 128.8m2) and internet connections are provided for everyone 24/7. Each room is equipped with a backdrop, sound system, screen, and projector. Various curated events and programs related to creativity and technology for various circles. These various activities aim to increase the capacity and talents of Surabaya's youth such as Inkubasi 1000 Startup Digital, Youtube Creator Day, GBG Bizfest, Kumpul Kreavi and Tata Rupa Prime (KORIDOR,2023).

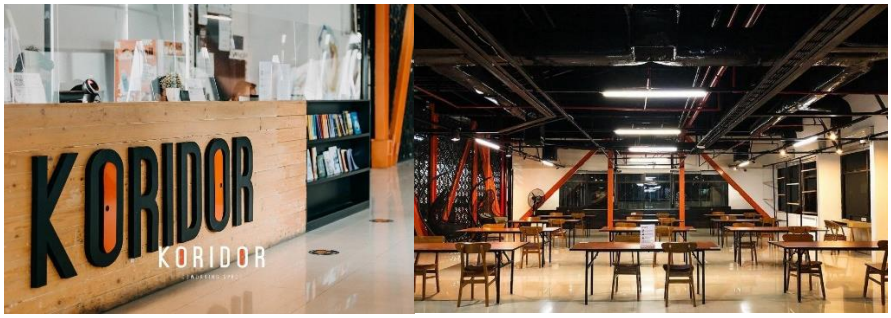


Figure 2.3. KORIDOR Co-working Space Surabaya (KORIDOR, 2023)

2.3.2 BRIWork

One of the banks in Indonesia has adjusted its operations to cope with the emerging trends. The bank currently places a strong focus on "customer experience" through the use of financial technology and modernization. BRIWork is the first co-working space combined with banking service in Indonesia. BRIWork is owned by Bank Republik Indonesia (BRI). BRIWork is the result of a collaboration between BRI Bank, Universitas Gadjah Mada (UGM), and Conclave. BRI Bank as a provider of banking facilities and services, UGM as a land provider, and Conclave as a provider of co-working space service. In addition, there are also other supporting facilities such as cafes, minimarkets, UMKM Showcases to promote products from UMKM who partnered up with BRI, BRILink Express, and an amphitheater. The facilities are expected to be able to share inclusive financial ideas that support a cashless society. After successfully launching BRIWork FISIPOL UGM in 2020, BRIWork built two more branches still located in the campus area, in Universitas Jember and Institut Pertanian Bogor namely BRIWork Unej and BRIWork Agro Hub IPB in 2022.

Figure 2.4. BRIWork FISIPOL UGM

2.3.3 MNC x Kolega

At the end of 2019, MNC x Kolega began its operations as the most strategic and spacious coworking space owned by PT. MNC Land Tbk. Together with

Kolega, one of the reputable coworking space providers, MNC Land created a coworking space with modern interior architecture that prioritizes comfort in all activities. Modern interior architecture is chosen because of the emerging trends in coworking spaces as it encourages collaboration and networking. This interior style of coworking space is what draws many creative professionals. Additionally, MNC x Kolega offers support services like high-speed internet access, printing and scanning, free mineral water, free coffee & tea, a pantry, a locker, a gaming area, and other facilities (Fajriah, 2020). Figure 2.5 illustrates the atmosphere within the coworking space.

Figure 2.5. MNC x Kolega

2.3.4 Alfa X

Alfa X is a new concept of minimarket owned by PT. Sumber Alfaria Trijaya Tbk (AMRT). According to AMRT management, Alfamart had conducted a study beforehand on Seven Eleven's unfortunate experience in Indonesia (Husaini, 2020). Finally, Alfamart decided to launch the concept of a paid co-working space. AMRT which continuously innovates, presents a unique cutting-edge collaboration between a conventional minimarket and a coworking space. Customer can experience co-working, entertainment, or simply a space to hang out at Alfa X. Currently, this newest Alfamart innovation has at least 12 locations that solely operates in Jakarta. In an attempt to serve

its customers good experiences, Alfa X provides free WiFi, a co-working area, food and beverages and a conference room within its area as illustrated in Figure 2.6. However, Alfa X also provides payment services, starting from bill payments, tickets andtravel, tokens/credits, as well as shipping.

Figure 2.6. Alfa X

2.4 Customer Satisfaction

Oliver (1981) defined the term customer satisfaction as “the summary psychological state resulting when the emotion surrounding disconfirmed expectation is coupled with the consumer’s prior feeling about the consumption experience”. Schiffman and Kanuk (2004) defined the term as the way a person feels a product or service performed in comparison to his or her expectations.

Associated with both products and services, customer satisfaction can be experienced in a variety of contexts. Customer expectations have a big impact on this extremely subjective evaluation. The customer's contact with the company as well as the results for themselves are factors that contribute to satisfaction. According to some academics, a satisfied client in the private sector is "one who receives significant added value" to their financial situation, which is a definition that might be equally applicable to public services (Hanan and Karp, 1989).

2.5 Customer Journey Maps

A customer journey map (CJM) is a diagram that shows the stages a certain customer takes to interact with a company or organization introduced by Colin Shaw, a pioneer in customer experience in 2002 (Kalbach, 2020). This map shows the user's journey to identify and comprehend the different phases, actions, and touchpoints a user must go through in order to complete a task from start to finish (Marquez et al., 2015). As there are more touchpoints, the map would be more complicated. The map is sometimes referred to as customer-company interaction. As seen in Figure 2.7, elements that are displayed on the map include the timeline, activities, motivations, questions and barriers.

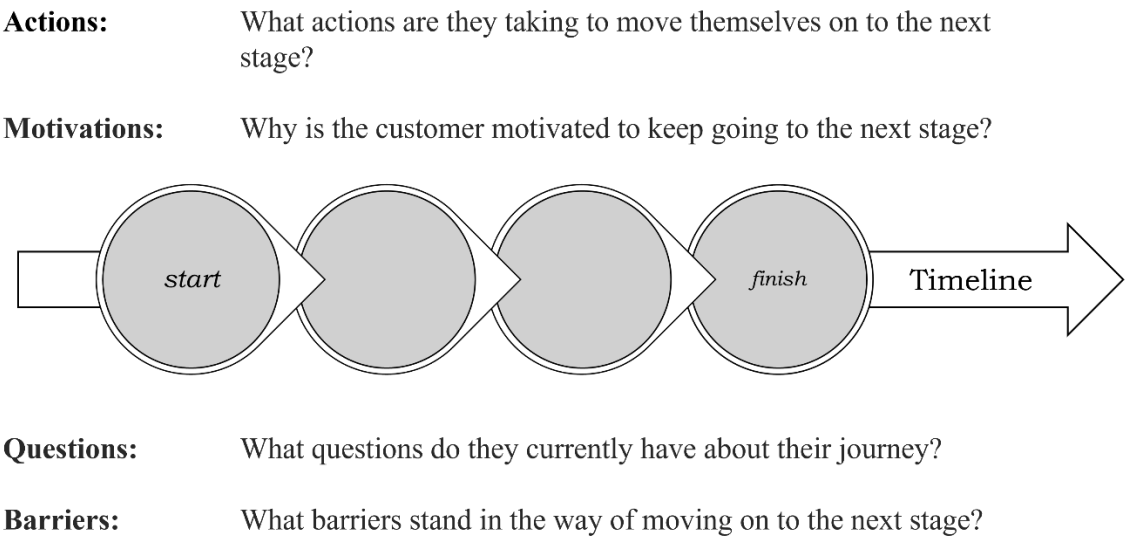


Figure 2.7. Customer Journey Map Structure (Richardson, 2010)

2.6 Kano Model

Kano and the colleagues proposed the theory of attractive quality to explain the relationship between the subjective aspect and objective aspect. The subjective part of quality is concerned with how individuals perceive, tthink, and feel. These perceptions are

broken down into three categories: (1) satisfied, (2) neutral, and (unsatisfied). The objective measurement of quality, in contrast, conveys how something is made. The terms sufficient and insufficient are used to describe this physical state. The growth of quality recognition is influenced by the intersection of these two factors, as shown in Figure 2.8 (Kano, n.d.)

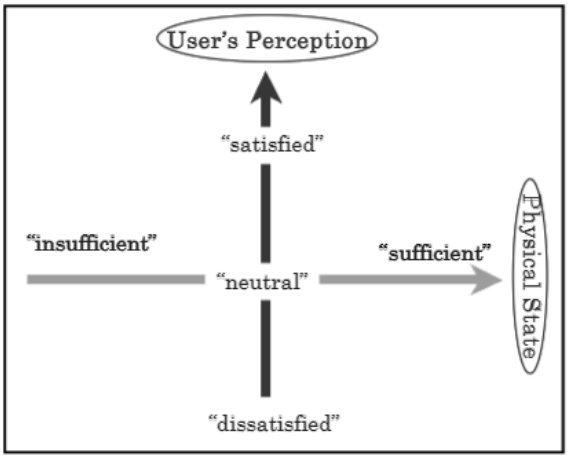


Figure 2.8. Two-dimensional Recognition of Quality (Kano, n.d.)

Mr. Noriako Kano created the Kano Model in 1984. The model aims to show how customer requirements and customer satisfaction are related. Kano used this model to measure customer's perceptions of various attributes when they are present in or absent from the offerings by identifying "customer's delight" and "customer's disgust" (Choudhury and Gulati, 2020). It is crucial for the business owner to identify which aspects of a product or service satisfy customers the most because customer satisfaction levels are one of the elements affecting business operations and competitiveness (Meng, et al, 2015). Figure 2.9 shows how the Kano Model helps in identifying must-be, one-dimensional and attractive aspects to satisfy consumer needs, but it does not indicate the level of satisfaction or discontent (Qiting, et al., 2011).

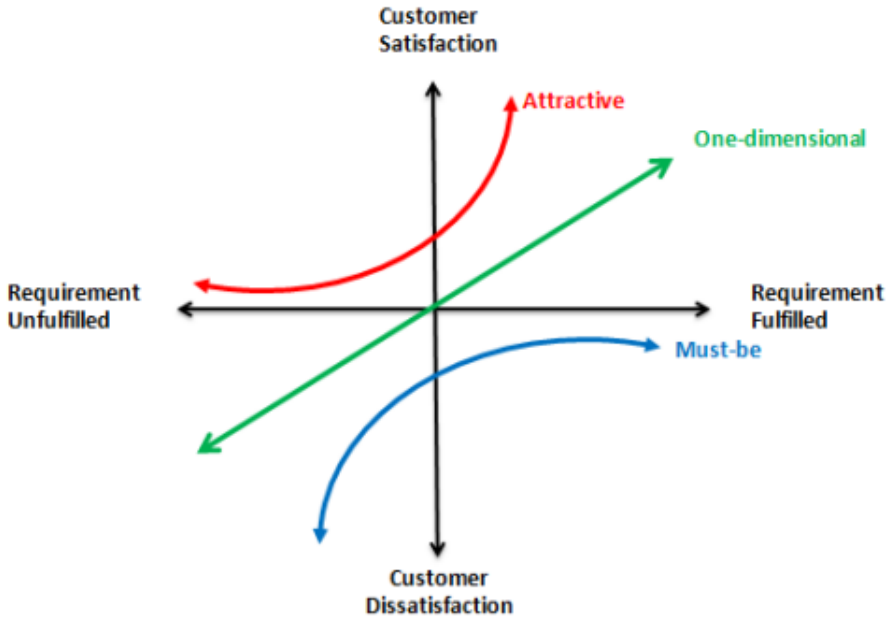


Figure 2.9. Kano Model Diagram – One Dimensional (Qiting, et al, 2011)

According to the Kano Model, He identified five categories of requirements:

1) Must-be requirements (M): the basic standards for a good or service. Customers will not be satisfied and will not be interested in the products or services if the requirements are not met. However, the customer is not satisfied despite its existence as it will not result in any higher levels of consumer satisfaction than neutral.
2) One-dimensional requirements (O): In terms of these requirements, customer satisfaction is directly correlated with how well a product or service satisfies those requirements. Therefore, during the process of designing a product or service, the requirements must be given high attention.
3) Attractive requirements (A): If these requirements are met, the customer will be exponentially satisfied. However, if they did not exist, the customer would not be dissatisfied. The customer neither expressly requests them nor expects them.

4) Indifferent requirements (I): If a requirement is considered as an indifferent quality, the level of satisfaction is unaffected whether by how that attribute is fulfillled or not.

However, Kermanshaci (2017) explained two other special categories which are Reverse Quality and Questionable Quality. Reverse Quality (R): For reverse quality, the consumer is less satisfied if the requirement if fulfillled. In another word, this is the requirement that, when presents, lowers enjoyment but improves when missing. Questionable Attributes (Q): These requirements receive conflicting or ambiguous answers. Before being used in the questionnaire, an analysis is needed in advance.

The benefits of the Kano Model were detailed by Qiting and his colleagues in 2011. First, the model helps in prioritizing all of the requirements that are accessible for product and service development. The must-be requirements are those that must exist, while the least important requirements to consider are the attractive requirements. Second, the model is used to analyze consumer satisfaction and wants, which promotes a better comprehension of each requirement. This results in even more precise market segmentation. The model also helps the process of design trade-offs. It can be used to determine which attribute, has the higher influence on customer satisfaction if two attributes of products or services cannot be provided together for technical or financial reasons.

Kano Model begins with a questionnaire that asks certain target customers about their opinions of a product or service. The questionnaire poses two questions for each quality of the product or service, one from a positive and one from a negative perspective (Madzik, 2019). Functional questions are positively asked and dysfunctional questions are negatively asked. In the questionnaire, we want to know

what customer feels regarding the product or service being offered by asking “how do you feel?”. The customer must select from the following options, “I like it”, “It must be that way”, “I am neutral”, “I can live with it”, or “I dislike it” (Qiting, 2011). A good requirement must be clear, concise and complete. It should not be mixed in with other requirements or overlap them. Before developing the requirements, to avoid confusion, avoid using the terms “must” or “should” in the requirement phrasing. It is suggested to use neutral words like “will” or “shall” (Voehl and Harrington,2017). Additionally, requirements must be precisely stated to prevent customer’s misunderstanding. The answers would then be converted into Kano’s Evaluation Table, which is depicted in Table 2.3 and Figure 2.10.

Table 2.3. Kano’s Evaluation Table (Qiting,2011)

Customer Requirements ⇩ / ⇨		Dysfunctional				
		1. like	2. must-be	3. neutral	4. live with	5. Dislike
Functional	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Customer Requirements:

A: attractive, O: one-dimensional, M: must-be, Q: questionable result, R: reverse, and I: indifferent.

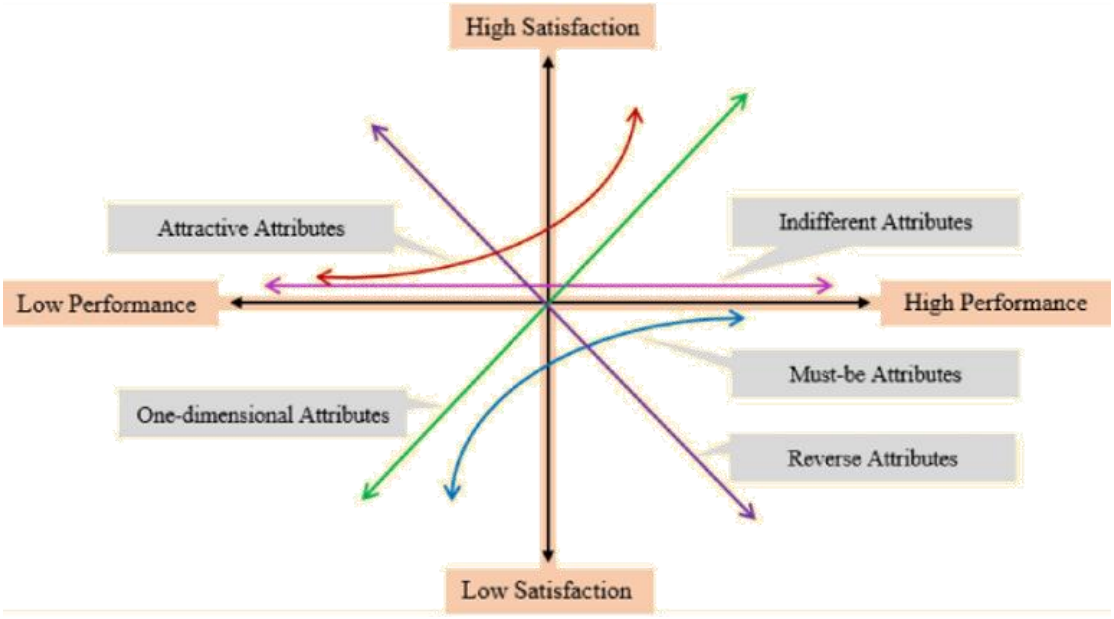


Figure 2.10. Kano Model Diagram (Two-dimensional) (Kermanshaci et.al., 2022)

According to Kano's methodology, the order of importance for each need is as follows: must-be, one-dimensional, attractive, and indifferent (Kano, n.d.).

2.7 Quality Function Deployment (QFD)

The Quality Function Deployment (QFD) approach is one way to organize the product development process. A few tools used in Total Quality Management (TQM) have been adapted into Quality Function Deployment (QFD). The QFD is a procedure that is defined as having the following basic characteristics: (1) customer-oriented, (2) team approach, (3) concise structuring communication, and (4) connecting information (Govers, 1996). This method systematically examines customer requirements and converts them into attributes of a product or service before it is manufactured. In addition, QFD helps the organization in many different ways including translating customer requirements into attributes of product or service, investigating the underlying causes of customer dissatisfaction, and helping organizations to make the key trade-

offs between what the targeted customer actually want and what the company can afford (Erdil and Arani, 2019; Govers,1996).

2.7.1 House of Quality

As a part of QFD, The House of Quality (HOQ) is one of the conceptual design tools that provide inter-functional planning and communication, and has been used in managing many industries including manufacturing, service, and strategic planning. “Quality function deployment focuses and coordinates skills within an organization, first to design, then to manufacture and market goods that customers want to purchase and will continue to purchase.” (Hauser and Clausing, 1988). The concept that products should be developed to reflect customer’s desires and tastes is the foundation of the HOQ. Therefore, marketing personnel, design engineers, and manufacturing people must collaborate closely from the beginning of the project. The usage of HOQ has advantages, such as the ability to prioritize processes by consulting the evidence listed on the grid of the house. There are difficulties in providing products and services that satisfy everyone at once since there are more aspects to what quality implies as there are many customers. As a result, in addition to the technical fit, the authority must learn from customer experiences (Hauser and Clausing, 1988). Figure 2.11 displays the House of Quality’s components (Govers, 1996).

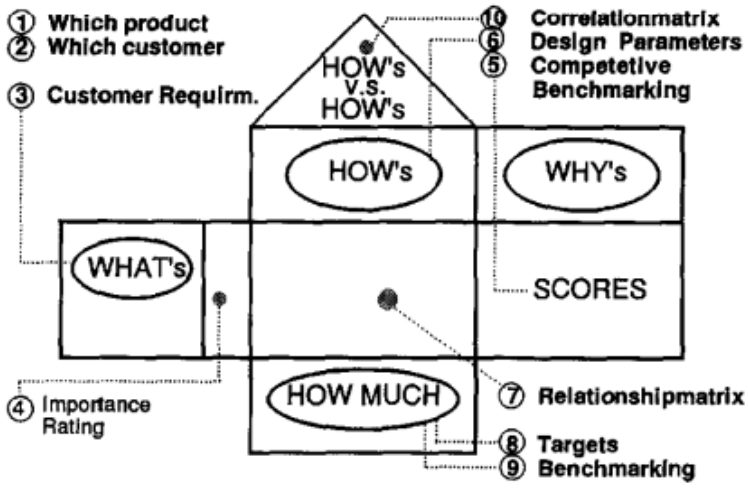


Figure 2.11. House of Quality Structure (Govers, 1996)

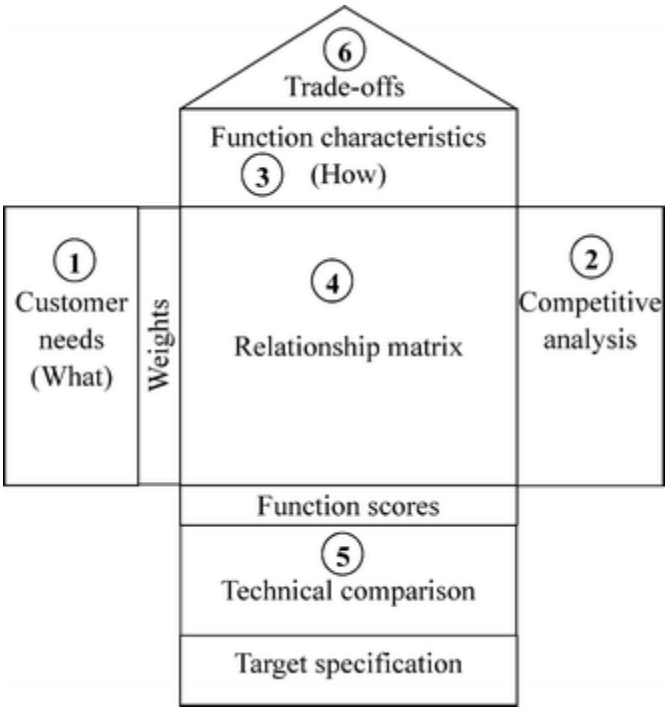


Figure 2.12. The Six Steps of "House of Quality" (Tsai and Chang, 2004)

The following are the steps in creating a House of Quality:

1) Determine the needs of the customers and gather their requirements in accordance with the Voice of Customers (VOC).
2) Do research potential competitor products or services and ask consumers whether they feel those products or services meet their needs.

3) Using the Voice of Engineers (VOE), the team must compile a list of technical requirements and how the customer needs will be met.
4) The relationship between each characteristic and each customer's requirement is represented by each cell in the matrix. Numbers will be used to represent the relationship, with 1,3, and 9 representing weak, medium and strong relationships respectively.
5) In this stage, the technical requirement of the competitor is converted into function levels that are expressed on a scale from poor to excellent.
6) Develop a technical correlation matrix, which is the roof component, to examine the relationships between customer requirements and technical requirements using symbols "x" and "o" to denote the negative an positive aspects respectively (Tsai and Chang, 2004).

2.8 Quality of Data Instruments Test

Quality test of data instruments is conducted to assess whether the research instrument has fulfillled validity and reliability criteria.

2.8.1 Validity Test

A validity test is used to determine whether a questionnaire is valid. According to Ghozali (2012), a questionnaire is regarded to be valid if its questions can revel an issue that will be measured by it. When the degree of freedom (df)= n-2 and alpha = 0.05, a significance test is performed by comparing the value of the r count with the r table.

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{(\sum x^2 - \frac{(\sum x^2)}{n} - (\sum y^2 - \frac{(\sum y^2)}{n}}}$$

Information:

r is the Pearson correlation coefficient

$\sum xy$ is the sum of the multiplication of x and y

$\sum x^2$ is the sum of the squared values of x

$\sum y^2$ is the sum of the squared values of y

2.8.2 Reliability Test

A reliability test is a tool for evaluating any coefficient that serves as an indicator for a variable or construct. If a person's behavior toward a statement is consistent or stable from day to day, that statement is regarded as reliable (Ghozali, 2012). Reliability testing is done only once, and the results are compared to other questions or corrected for inter-question correlation. With the aid of statistics, SPSS provides the ability to assess reliability using Cronbach Alpha (Cro) (Ghozali, 2012). Any structure or variable is considered reliable if it has a Cronbach Alpha value greater than 0.6 according to Ghozali (2012). The formula that was used to calculate Cronbach Alpha is as follows:

$$r_x = A = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum \sigma t^2}{\sigma t^2}\right)$$

Information:

r_x is the desired reliability

n is the number of questions $\sum \sigma t^2$

$\sum \sigma t^2$ is the sum of the variance scores of each question

σt^2 is the total variance

2.9 Previous Research on Quality Function Deployment for Service Design

Various industries use the QFD when designing products or services. Here are some examples of how QFD the Kano Model integration, together with the fields in

which they are applied. Several journal articles have been chosen, studied and evaluated for the analysis of this research.

Table 2.4. A few Reviews of the Literature on kano Model Integration and Quality Function Deployment

Authors	Title	Year	Approach	Identified Results
Anjar Priyono and Andina Yulita	Integrating Kano Model and Quality Function Deployment For Designing Service in Hospital Front Office	2017	Kano Model – HOQ-QFD	The Kano Model and QFD are combined in this study to improve the service quality in Hospitals in Yogyakarta. This study shows that the customer expectations are far higher than the level of service provided by the Hospital. As benchmarking with competitors, providing a comfortable waiting area at the front office and giving patients about doctor's accurate timetable are the two traits that should be given top priority for improvement in the hospital case study.
Vahid Moghimi, Mahmud Bin Mohd Jusan, Payam Izadpanahi, Jamaleddin Mahdinejad	Incorporating User Values into Housing Design Through Indirect User Participation Using MEC-QFD Model	2017	Means-end chain (MEC) – QFD -	To provide quality housing design and close the gap between external customer needs and internal production quality, researchers applied the means-end-chain and quality function deployment models in gathering user requirements and values. Researchers interview and distribute surveys to facilitate the customer

				involvement from the perspective of housing design and living environment. The proposed design strategies were identified according to four categories which are building, organizational, interior design, exterior design and indoor environmental.
Adila Md Hashim, and Siti Zawiah Md Dawal	Kano Model and QFD integration approach for Ergonomic Design Improvement	2012	Kano Model-HOQ-QFD	The Kano Model and Quality Function Deployment are combined in this study to improve a school workshop workstation in Selangor, Malaysia. design in terms of ergonomics and customer requirements. The study used the Kano Model applied with the House of Quality matrix in prioritizing the improved elements. The participants aged between 14-15 years old. The customer requirements of how the new design should look like were successfully identified.

Chapter 3 Research Method

In this chapter, the research methodology including the research subject, research methodologies, data collecting, and stages of the research is explained.

3.1 Research Subject

The state-owned oil and gas company known as PT. Pertamina EP Sangasanga Field, will serve as the case study business unit for this research project. It's primary responsibilities include the oil and gas exploration and exploitation throughout the five working fields as well as the operation of the functions within the organization. The goal of this study is to provide an answer to the question, "what attributes should be offered in a co-working space in PT. Pertamina EP Sangasanga Field? And what are the suggested services in order to strategically fir to the employee's needs and the emerging trends?"

3.2 Research Method

Due to the following factors, the study uses both qualitative and quantitative research approaches:

1) Research on user requirements, human behavior, and journey maps is one of the research inputs. However, different people frequently have varied attitudes and feelings about the same particular thing, thus these inputs must be gathered and carefully analyzed.
2) The quantitative component is then introduced by converting qualitative data facts about various characteristics, such as the number of users and the purpose of use, into measurable units.

3.3 Data Collection

The input information is gathered from the organization's database, which includes information like the total number of employees and the current area utilization rate. The market research is then carried out to obtain direct customer insight. An online survey is used to gather the other inputs. The user's satisfaction as well as their purpose of using the product are covered in the questions. Later, a comprehensive analysis of all data dimensions will be carried out.

3.4 Phases of the Research Study

Based on what stated in 3.2 and 3.3 of this chapter, the research consists of four consecutive phases:

1) Collection of information
2) Concept Interpretation
3) Application of the Kano Model with Quality Function Deployment (QFD) principle in co-working space design, and
4) Conceptual design

3.4.1 Background Information and Statistical Facts

3.4.1.1 Internal Factors

At Sangasanga Field, PEP now manages a training center with total of space about 15 x 6 square meters. The area is considered a medium-sized area. This training center is used by the company to hold meetings, training, vaccination, blood, medical check-up, and vaccination. However, because of the poor facilities and unsupportive atmosphere against new trends, the training center's utilization rate is incredibely low.

More than half of the space is taken up by chairs, and the remaining half is designated as a training area with just tables and uncomfortable chairs available for use as provided as a service. Additionally, there are only a few electrical outlets installed. The present atmosphere can be seen in the figures below.

Figure 3.1. Training Center PEP Sangasanga Field

Figure 3.2. PEP Sangasanga Field Activities in Training Center

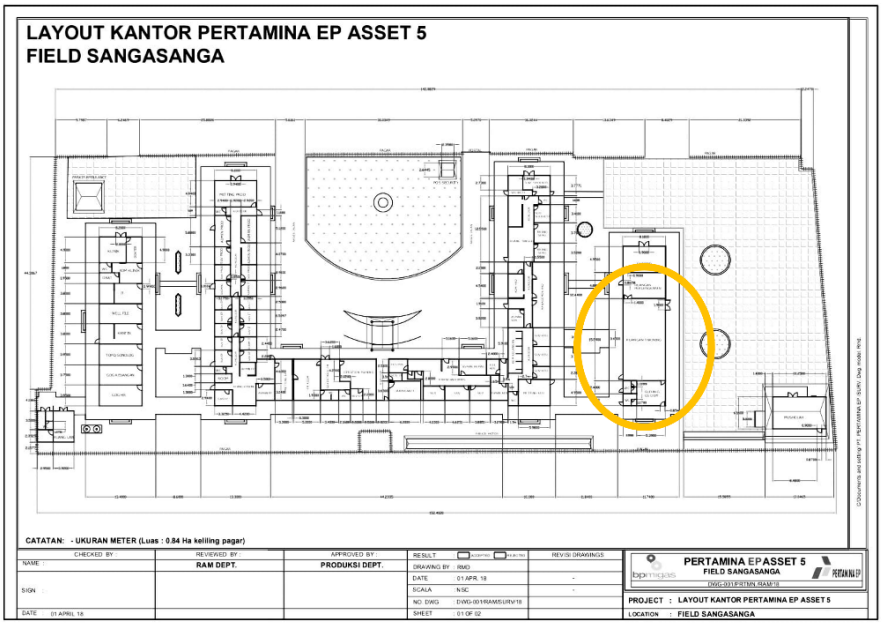


Figure 3.3. Training Center Location in PEP Sangasanga Field

According to research, average people that visit the training center is very low each day. This includes the staff from General Service, or regular employees that has booked the training center for certain activities to Human Capital Department. If there is no activities held in training center, the utilization rate of daily visitors divided by total amount of employees at PEP Sangasanga Field is very low.

At this point, the customer journey map shown in Figure 3.4 is used to see what activities are done by the visitors.

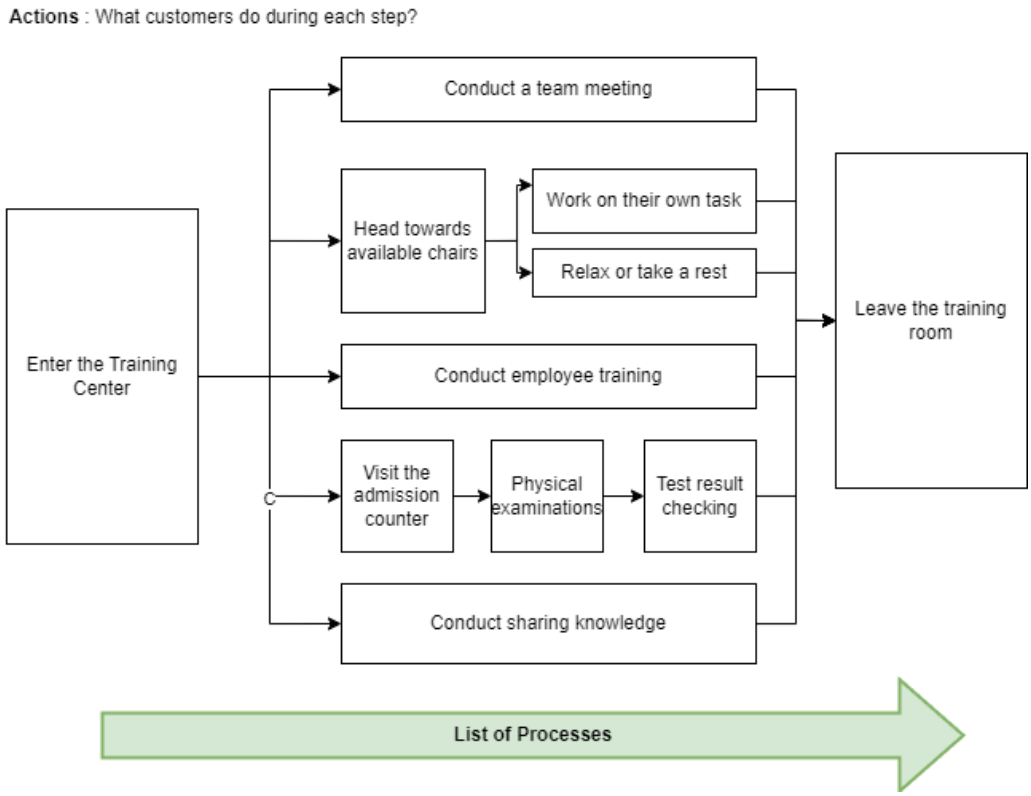


Figure 3.4. Customer Journey Map

The next stage is to gather the activities that the visitors engaged in the training center. Based on interview, the The statistic shown in Figure 3.5, reveals that 71% of the visitors spend about 2-3 hours in the training room to use the meeting room service, while another 17% spend to hold sharing knowledge activities. The remaining 8% of the visitors use the training room to join employee training, 5% spend to work on their individual or group tasks and 2% spend to follow annual medical check-up.

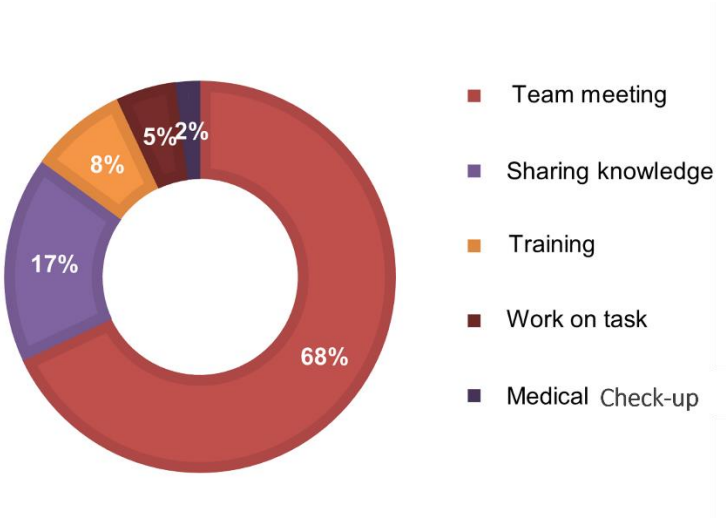


Figure 3.5. Purpose of Training Center Use

3.4.1.2 External Factors

PEP Sangasanga Field faces a challenge by offering services that satisfy employee needs, fit with emerging trends in workplace behavior, through the inspiring environment and supportive services, suit the organizational culture and promote the growth of new innovations within the firm. In order to achieve sustainability and performance excellence through the use of technologies to establish new innovations, the organization must participate in completing and developing the capabilities as well as the professionalism of the new generation of workers. Additionally, the company needs to move forward with offering services that match the traits of these youthful generations, who favor mobility in the workplace.

Facilities and support services are the two main categories that might be used to categorize the service design and development that went into converting the conventional training center into a modern co-working space. The facilities include (1) multipurpose rooms for working, meeting and training purposes, (2) Office equipment, (3) electrical outlet and Wi-Fi connectivity, (4) A coffee and snack station, and (5)

Additional useful and decorative furniture. In this context, supported services refers to the backend operations required to produce engaging user interfaces and beneficial user experiences.

Additionally, it is anticipated that the creation of co-working spaces will aid in lowering employee stress, enhancing productivity, encouraging greater creativity, increasing revenue, creating a flexible work environment, and transforming the company into a joyful workplace.

3.4.2 Concept Interpretation

At this phase, the company can then translate the customer needs and translate them into design requirements. The goal of this research is to provide an alternative design of a co-working space located in PEP Sangasanga Field aiming at improving service quality, offering a better working atmosphere and facility, boosting the creativity and innovation culture, as well as promoting the interactions between groups of employees. PEP Sangasanga Field employees will be the target audience for this research.

.4.3 Application of Kano Model with Quality Function Deployment (QFD) principle in co-working space design

The research method follows the steps in Figure 3.6. It begins with the gathering of voice of customer (VOC) and translates it into customer

requirements

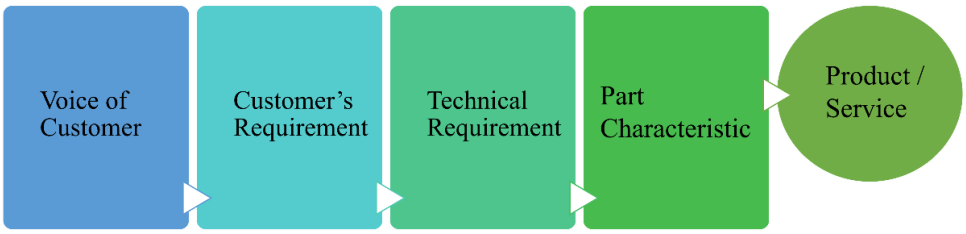


Figure 3.6. QFD Principle

3.4.3.1 Voice of Customer

The research uses a questionnaire to gather customer requirements. The questionnaire is open to all PEP Sangasanga Field employees. The questionnaire asks the respondents how satisfied they are with the current office and how satisfied they would be if the company had a co-working space. Additionally, questions concerning preferred services are also present and will subsequently be used in the co-working service design.

3.4.3.2 Customer Requirement

Based on the responses to the online survey, the customer requirements are listed. The importance weight of each requirement is calculated using the proportion of employee preference. Additionally, the suggestions from the survey respondents will be summarized as inputs.

3.4.3.3 Technical Requirement

The firm takes the relationship between satisfaction and requirement into consideration since customer satisfaction levels play a significant role in business operations and help increase business operations and help increase business competitiveness. In this phase, the Kano Model is used to describe how subjective and objective aspects relate to one another. The Kano Model is helpful in figuring out how to meet the precise needs of the customers.

In order to determine the services that should be offered in the co-working space, the questionnaire's questions were created to fit the Kano Model. The questions are written positively. The feedback would be translated and categorized into the following Kano categories as (1) Must-be quality, (2) One-dimensional quality, (3) Attractive quality, (4) Indifferent quality and (5) Reverse quality as explained in 2.5.

Table 3.1 illustrates the connection between subjective and objective purpose.

Table 3.1. Kano Evaluation Table of Customer Requirements (Qiting, 2011)

Customer Requirements ⇩ / ⇨		Dysfunctional				
		1. like	2. must-be	3. neutral	4. live with	5. Dislike
Functional	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Customer Requirements:

A: attractive, O: one-dimensional, M: must-be, Q: questionable result, R: reverse, and I: indifferent.

The designed services are then prioritized based on the each of Kano categories. The must-be category, one-dimensional category, and attractive category are each used to describe how necessary the designed services are. Additionally, the indifferent category, sometimes known as the neutral, indicates the average level of customer satisfaction. Customers neither anticipate nor are satisfied by this category.

3.4.3.4 House of Quality

Instead of what the company believes its employees would expect, inputs for the QFD must reflect what the customers actually want. Figure 3.7 illustrates the actions to take in order to fulfill the house of quality. Additionally, the business must ensure that there is always room for improvement.

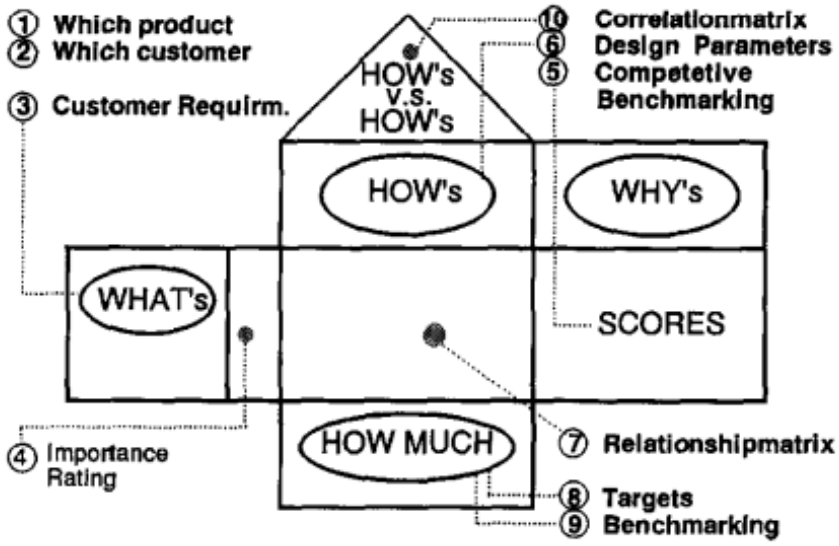


Figure 3.7. The House of Quality (Govers, 1996)

When all the requirements have been gathered, the list of those needs should be sufficiently detailed in order to allow the decision-making process to rank each requirement according to importance. To accomplish this, the researcher used a simple

ranking method. Additionally, by utilizing QFD, the business is able to establish design parameters analyze relationships, and compare its level of competitiveness to that of its rivals. Finally, using Table 3.2, the correlation matrix is created utilizing all the inputs and analysis.

Table 3.2. House of Quality Template

		Technical Requirements (How's)									
		Facilities					Services				
Customer Requirements (What's)	Importance Weight										
Technical Importance Weight											
k-value											
Adjusted Technical Importance Weight											
Adjusted Technical Importance Weight (%)											

Relationships		Weight
Strong	•	9
Medium	○	3
Weak	▽	1

As an additional factor, the k-value from the Kano Model is incorporated in the house of quality. The technical important weight and the k-value are multiplied to get the adjusted technical weight. This is done in order to include customer satisfaction together with consumer and technical requirements as one of the important considerations.

3.4.4. Conceptual Design

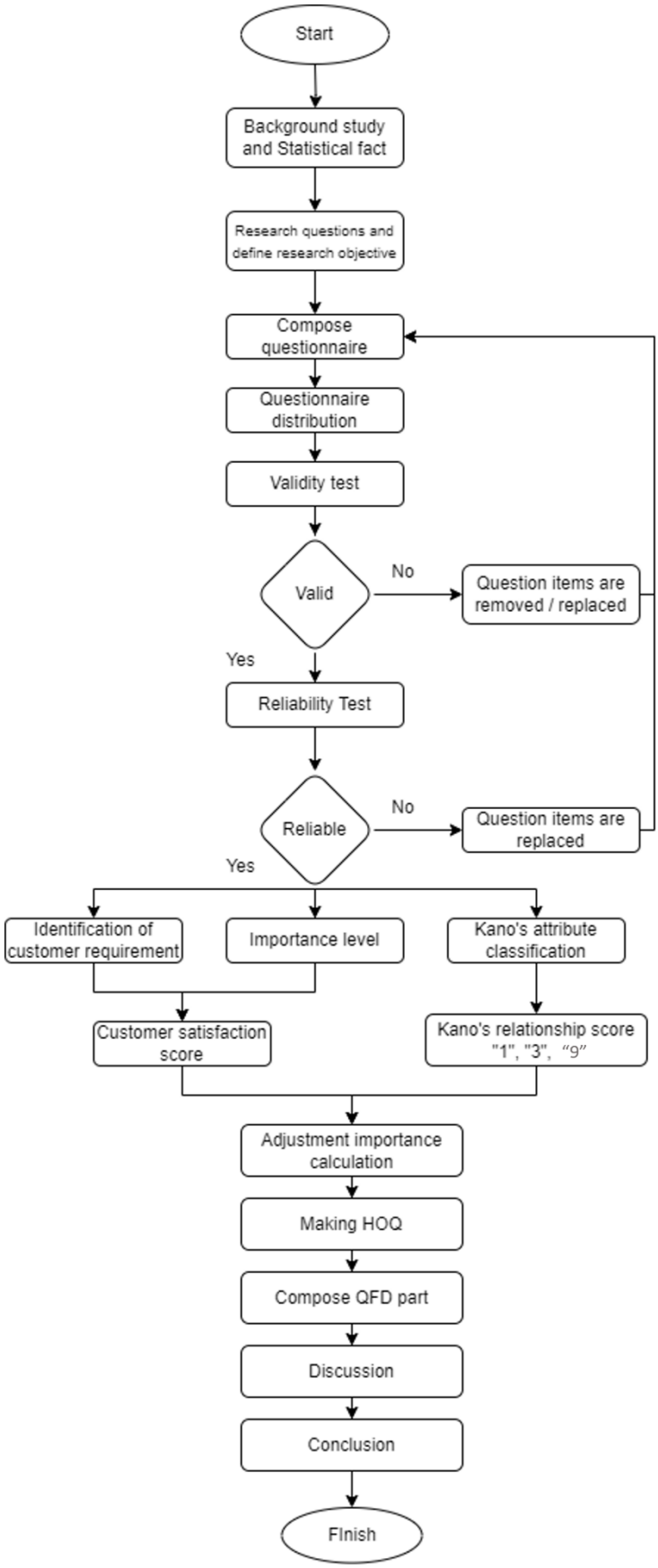
The QFD was utilized to translate the voice of the customer (VOC) into engineering design quality while the Kano Model revealed the categories of requirements from the customer's perspective. Up until this point, the co-working space will be planned in accordance with the results of the House of Quality, using the QFD principle in combination with the Kano model's outcome. This methodology was developed from Hashim and Dawal's (2012) study on the topic of improving school workshop's ergonomic designs in Malaysia. In order to change the work environment with an ergonomic approach, researchers designed a strategy to identify and prioritize the students and technical requirements. Researchers applied the Kano Model with the Quality Function Deployment. The process began by gathering the information from the targeted customers regarding their needs, then, the clarification and prioritizing were carried out using the house of quality.

Interior design is a topic of concern from an architectural standpoint. First, the human body must be taken into consideration in addition to the ideal area allocation. Second, the entire population's circular area is highlighted. Third, the design of any space is influenced by the surroundings and their specifics, including color, structure, pattern, furniture, and materials. Additionally, other facilities and the lighting system should be taken into account. When a building's lighting is perceived as comfortable (e.g. little glare, reflection, or contrast), the employee's satisfaction with their working space increases (Kim and De Dear, 2012).

The major components of the co-working space are implied in a summary of the conceptual design that would be helpful to the interior designer. Since the design concept is somewhat arbitrary, it is challenging to fully comprehend and cater to the needs of various users. The research does not cover the design process, which is the

responsibility of the interior designer. However, the preliminary co-working space interior design will be presented for PEP Sangasanga Field is meant to be given to the interior designer team as a design framework due to the architectural issues.

3.5 Research Workflow



Chapter 4 Results

In accordance with the research method, the findings from each phase of the research described in the preceding chapter are explained in this chapter.

4.1 Instrument Test

4.1.1 Validity test

The questionnaire is considered valid if the question can reveal something that is measured from the questionnaire. The validity test in this study was processed using SPSS Version 26. The validity test in the study was used to measure whether a questionnaire was valid or not with a total score at a significance level of 5% and a total sample of 15 respondents. To test its validity, the researchers compared the Pearson correlation for each item with the moment product r table. If rcount > rtable then the statement item is declared valid. The results of the validity test can be presented in the table below with n = 15, then a df of 15-2 = 13 and α = 5% is obtained, so the rtable value is 0.5140.

r_i>0.5140 then the questionnaire statement items are valid

r_i <0.5140 then the questionnaire statement items are invalid

The following is the result of the validity test calculation:

Table 4.1. Validity Test Result

Item	Rcount	Rtable	Decision
1	0.837	**0.5140**	**Valid**
2	0.735	**0.5140**	**Valid**
3	0.531	**0.5140**	**Valid**
4	0.617	**0.5140**	**Valid**
5	0.697	**0.5140**	**Valid**
6	0.606	**0.5140**	**Valid**
7	0.675	**0.5140**	**Valid**
8	0.600	**0.5140**	**Valid**
9	0.709	**0.5140**	**Valid**
10	0.617	**0.5140**	**Valid**
11	0.540	**0.5140**	**Valid**
12	0.757	**0.5140**	**Valid**
13	0.827	**0.5140**	**Valid**
14	0.735	**0.5140**	**Valid**
15	0.576	**0.5140**	**Valid**
16	0.533	**0.5140**	**Valid**

17	0.715	**0.5140**	**Valid**
18	0.759	**0.5140**	**Valid**
19	0.827	**0.5140**	**Valid**
20	0.881	**0.5140**	**Valid**

Based on the results of the validity test of the correlation coefficient of the questions in the table above, information is obtained that all of the 20 questions have a value of rcount > rtable, thus it can be said that the 20 items are valid and can be used to conduct reliability tests.

4.1.2 Reliability Test

The value of the correlated item-total correlation in an indicator to be declared reliable is at least 0.70. The following are the results of the reliability test of each variable

Table 4.2. Reliability Test Result

N Of Items	Cronbach Alpha	Decision
20	**0.924**	**Reliable**

Based on the reliability test results in the table above, information is obtained that the Cronbach's Alpha value is 0.924, thus it can be decided that the Cronbach alpha value is > 0.70. Based on this, it can be concluded that the question is feasible to use for further research.

4.2 Voice of Customer

Table 4.3 shows information on the participants' demographics.

Table 4.3. Demographic Characteristics of Respondents

Age	Percentage
Younger than 26 (Generation Z)	30.2%
Ages 26 to 40 (Generation X)	39.5%
Aged between 41 to 55 (Generation Y)	20.9%

Baby boomers who are older than 55	9.3%

Division	Percentage
RAM (Reliability, Availability and Maintenance)	16.3%
SCM (Supply Chain Management)	18.6%
WOWS (Work Over and Well Service)	16.3%
HSSE (Health, Safety, Security, & Environment)	14%
Production and Operation	14%
Petroleum Engineering	7%
ICT (Information and Communication Technology)	2.3%
Finance	11.6%
Administrative (Legal Relations, Human Capital, etc)	0%

PEP Sangasanga Field's employees are also asked about how happy they are with their existing workplace and whether they think the company should have a co-working area. The results of the survey indicate that more than half of the employees feel indifferent to their current workplace. However, the majority of them do support the inclusion of the common area inside PT. Pertamina EP Sangasanga Field. None of them, however are unhappy with the company establishing the co-working facility. Figures 4.1 and 4.2 display the numerical statistics.

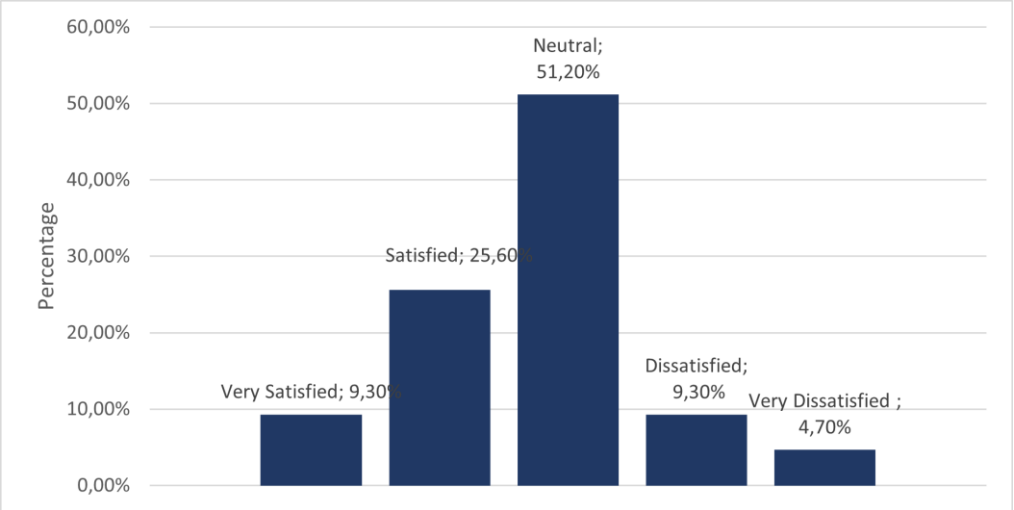


Figure 4.1. Satisfaction of Employees with Their Current Office

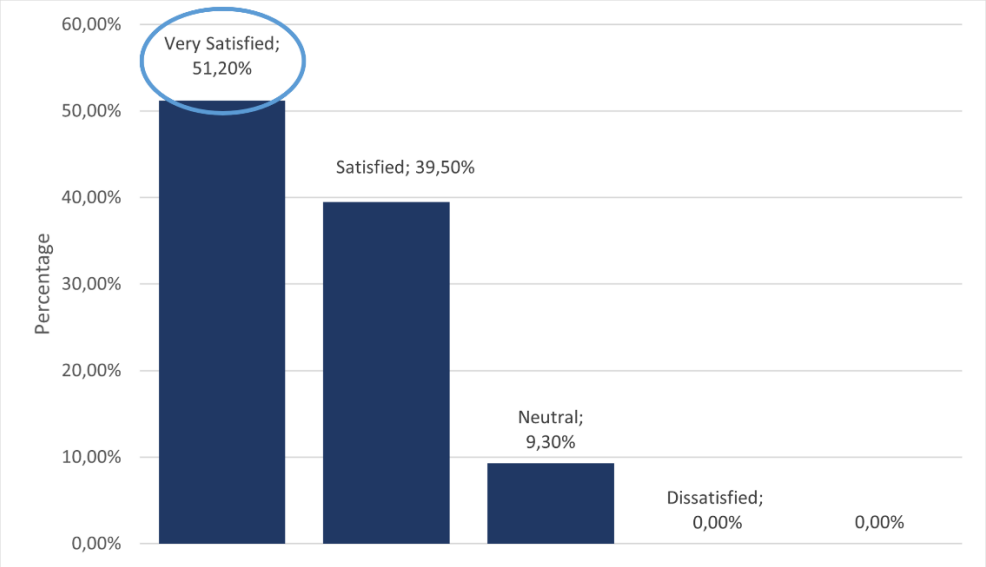


Figure 4.2. Employee Satisfaction with The Company's Co-working Space

Additionally, some of the participant's proposals include:

- Facilities

  The current training center's outdated aesthetics are not impactful on PEP Sangasanga Field. A communal workspace, or at the very least a location for informal meetings, should be available at PEP Sangasanga Field. However, the space must be furnished with contemporary furnishing to accommodate employees from all generations. Additionally, there should be numerous areas where employees may sit in collaborate in groups, and build on personal ideas by providing various room facilities and recreational facilities like table soccer. For operating the laptop conveniently, a table and a power outlet should be available. Additionally, the area could be divided into a zone with and without noise restrictions This idea could be realized by renovating the large area of the current training center.

- Services

To ensure hygiene, the area should permit visitors to carry drinks with a tight cover. Additionally, a projector borrowing service is suggested. At the same time, PEP Sangasanga Field should think about holding a small meeting or function there. It is advised that the co-working space's operating hours should not be dependent on the business's regular business hours. Even though regular business hours end at 4 PM, the facility should be open until 8 PM in case any employee groups need to work past that time or need to hold an important meeting that should not be disturbed.

4.3 Customer Requirements

Table 4.4 displays the customer requirements obtained from the questionnaire.

Table 4.4. Customer Requirement's (What's)

No.	Customer requirement (What's)	Employee Preference	Importance weight (%)
1.	Do routine work	0.837	18.6%
2.	Team meeting	0.884	19.7%
3.	Engage in creative work	0.86	19.2%
4.	Building a community	0.651	14.5%
5.	Self-reading	0.163	3.6%
6.	Self-learning	0.209	4.7%
7.	Do hobbies	0.209	4.7%

8.	Rest and relax	0.512	11.4%
9.	Drinking	0.163	3.6%
		4.448	100%

4.4 Technical Requirements

4.4.1 Kano Model

Here, the Kano Model is used to specify the technical needs to satisfy customer requirements. This procedure begins with a questionnaire asking specific co-workers about their opinions of a product or service. The participants responded positively to the questionnaire's questions. The targeted participants must select one of the options listed in Table 4.5 with satisfied, must-be, indifferent, I can live with it, and dissatisfied.

Table 4.5. Technical Requirements (How's)

In a co-working space, how would you feel if you….		**Percentage**	**Technical requirement**
Can do the activities you like in the allocated space	Satisfied	93.02%	Allocated area
Can work alone without making noise in open space	Indifferent	79.06%	
Can print or photocopy	Satisfied	74.41%	Printer
Finished job, printed elsewhere	Dissatisfied	76.74%	
Can have drinks without leaving the area	Must-be	76.74%	Drink Showcase / Vending machine
Can have drinks from outside	Dissatisfied	62.79%	
Can store your belongings	Indifferent	69.76%	Locker
Must carry your stuff	Indifferent	90.69%	
Can get internet access via Wi-Fi / LAN	Satisfied	86.04%	Wi-Fi / LAN
Can get internet access via personal hotspot	Indifferent	72.09%	

Can charge electronics gadgets on the table	Indifferent	60.46%	Power outlet at all table
Can charge electronic devices at charging points	Dissatisfied	58.13%	
Make notes on erasable board	Indifferent	83.72%	Erasable board
Write notes in your notebook	Indifferent	86.04%	
Present files using electronic files via computer	Indifferent	76.74%	Projector and LCD screen
Bring their own laptop/tablet for meetings and presentations	Indifferent	83.72%	
Can use the co-working space whenever you want	Satisfied	97.67%	Operation hours
Visit the co-working space during office hours only	Indifferent	62.79%	
Can read with reading books provided	Satisfied	95.34%	Book shelf
Bring personal books or reading	Indifferent	86.04%	

The responses are then translated into Kano's model in accordance with Qiting's (2011) customer requirement evaluation table (presented in Table 4.6 and summarized as explained in table 4.7.

Table 4.6. Kano's Evaluation Table (Qiting, 2011)

Customer Requirements ⇨ / ⇩		Dysfunctional				
		1. like	2. must-be	3. neutral	4. live with	5. Dislike
Functional	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Table 4.7. Kano Category of Requirement

Technical requirement	**Evaluation table of technical requirements**		**Importance of the technical requirement**
Allocated area	Functional	Satisfied	Attractive (A)
	Dysfunctional	Indifferent	
Printer	Functional	Satisfied	One-dimensional (O)
	Dysfunctional	Dissatisfied	
Vending machine	Functional	Must-be	Must-be (M)
	Dysfunctional	Dissatisfied	
Locker	Functional	Indifferent	Indifferent (I)
	Dysfunctional	Indifferent	
Wi-Fi / LAN	Functional	Satisfied	Attractive (A)
	Dysfunctional	Indifferent	
Power outlet at all table	Functional	Indifferent	Must-be (M)
	Dysfunctional	Dissatisfied	
Erasable board	Functional	Indifferent	Indifferent (I)
	Dysfunctional	Indifferent	
Projector and LCD screen	Functional	Indifferent	Indifferent (I)
	Dysfunctional	Indifferent	
Operation hours	Functional	Satisfied	Attractive (A)
	Dysfunctional	Indifferent	
Book shelf	Functional	Satisfied	Attractive (A)
	Dysfunctional	Indifferent	

According to Kano (n.d.), the weighted priorities for each criterion are nine, five, three, and one, respectively, and are described as must-be, one-dimensional, attractive, and indifferent. The k-value used to assess the significance of each technical requirement is shown in Table 4.8.

Table 4.8. Kano Category per Technical Requirement and k-value

Technical requirement	**Importance of the technical requirement**	**Importance weight**	**k-value (%)**
Allocated area	Attractive (A)	3	7.89%
Printer	One-dimensional (O)	5	13.16%
Drink vending machine	Must-be (M)	9	23.68%
Locker	Indifferent (I)	1	2.64%
Wi-Fi / LAN	Attractive (A)	3	7.89%
Power outlet at all table	Must-be (M)	9	23.68%
Erasable board	Indifferent (I)	1	2.64%
LCD and projector	Indifferent (I)	1	2.64%
Operating hours	Attractive (A)	3	7.89%
Book shelf	Attractive (A)	3	7.89%
		38	100%

4.5. House of Quality

With the values of 9,3,1, respectively, the link between customer requirements and technical requirements is classified as strong, moderate, and weak. Table 4.9. summarizes the concept design using the house of quality and the k-value that was applied and determined using the Kano Model.

Table 4.9. House of Quality of Co-working Space Design for PEP Sangasanga Field

		Technical Requirements (How's)												
		Facilities											Services	
Customer Requirements (What's)	Importance Weight	Allocated Area	Printer	Drinking Vending Machine	Locker	Wi-Fi / LAN	Power outlet at all table	Erasable board	Projector LCD screen	Book shelf	Operation hours			
Do routine work	0.186	●	▽	○	▽	●	●	○	○	○	▽			
Team meeting	0.197	●	▽	○		●	○	●	●		○			
Do creative work	0.192	●	○	○	▽	●	○	●	●	○	●			
Building a community	0.145	●		○		○	▽	▽	▽		●			
Self-reading	0.36	●		○	●	●	○			●	●			
Self-learning	0.47	●		▽	●	●	○			●	●			
Do hobbies	0.47	●			○	▽	▽	▽	▽	○	○			
Rest and relax	0.114	●			●	○	▽			○	●			
Drinking	0.036	●		●		▽					○			
Technical Importance Weight		19.53	0.959	4.034	10.284	13.928	6.06	4.674	4.674	10.356	13.824			
k-value		0.0789	0.1316	0.2368	0.0264	0.0789	0.2368	0.0264	0.0264	0.0789	0.0789			
Adjusted Technical Importance Weight		1.54092	0.12620	0.95525	0.27150	1.09892	1.43501	0.12339	0.12339	0.81709	1.09071			
Adjusted Technical Importance Weight (%)		20.32	1.66	12.60	3.58	14.49	18.93	1.63	1.63	10.78	14.38			

Relationships		Weight
Strong	●	9
Medium	○	3
Weak	▽	1

The construction of the proper infrastructure, which holds a percentage as high as 85.62% is shown to be the most essential feature in coworking space design by the house of quality in Table 4.10, while the service components are less concerned by the customer.

Table 4.10. House of Quality of Co-working Design (Kano-category)

	Technical Requirements (How's)									
	Facilities									Services
	Allocated Area	Printer	Drinking Vending Machine	Locker	Wi-Fi / LAN	Power outlet at all table	Erasable board	Projector LCD screen	Book shelf	Operation hours
Kano Category	A	O	M	I	A	M	I	I	A	A
Adjusted Technical Importance Weight (%)	20.32	1.66%	12.60%	3.58%	14.49%	18.93%	1.63%	1.63%	10.78%	14.38%

4.6 Conceptual Design

The solution will be offered in accordance with the house of quality in Table 4.10 and will provide specific facilities, service design, and purpose of usage as shown in Table 4.11 below.

Table 4.11. Prioritization of Coworking Space Components in order of Importance

	Technical Requirements	Kano Category	Importance Weight (%)
Facility	Power outlet at all table	Must-be	18.93%
	Drink Vending Machine	Must-be	12.60%
	Printer	One-Dimensional	1.66%
	Allocated Area	Attractive	20.32%
	Wi-Fi/LAN	Attractive	14.49%
	Book Shelf	Attractive	10.78%
	Erasable Board	Indifferent	1.63%

	Projector and LCD screen	Indifferent	1.63%
	Locker	Indifferent	3.58%
Service	Operation hours	Attractive	14.38%

The power outlet that must be installed at every table and the beverage vending machine, are among the criteria listed in table 4.11's datasheet as "must-be". The design of the co-working space revolves around these two aspects, power outlets at the tables and drink vending machine. To satisfy consumer needs, these two items must be installed in the co-working space. These facilities do not increase employee satisfaction. However, if there were no drinking vending machines, or power outlets at the tables, the employee would not be satisfied.

Even if the printer has a lower importance weight than the other seven components, it is still regarded as a one-dimensional category and the absence of it may make the employee unsatisfied. Printers are therefore more necessary than other items. The company should provide at least one printer in the area to satisfy its employees.

If it is well structured, the area allocation and internet network are the elements that might draw the employees. The higher quality of these two factors, promotes organizational employee satisfaction. However, if their needs are not met, the employees will not be unsatisfied. In contrast, the availability of a locker, projector, LCD screen, and erasable board has no impact on employee satisfaction.

4.6.1 Facilities

One of the appealing aspects of service design in a co-working space is proper space allocation. According to the comments obtained from the questionnaire, the area

allocation could be separated into several sorts of rooms. Using the idea that each room type directly relates to employee preference, the area's prioritizing is concluded in Table 4.12 with reference to employee preference.

Table 4.12. The Importance of Each Type of Room

Room Type	Employee Preference	Importance Weight (%)
Group meeting area	0.86	19.47%
Hot desks	0.721	16.32%
Recreation area	0.86	19.47%
Event/workshop/exhibition area	0.535	12.11%
Relaxed zone	0.814	18.42%
Individual seat	0.628	14.21%

This results in the area being divided based on the data in Table 4.12. It could draw the conclusion that the design of the 90 square meters of the new co-working space allocation should be done in accordance with this suggested priority. Six different room types are included in the suggested model: hot desks, individual chairs, recreation zones, group meeting areas and, areas for events, workshops, sharing knowledge and exhibitions.

4.6.1.1 Group Meeting Area

The group meeting area is defined as the space furnished for group meetings, as well as for group work that involves brainstorming and sharing ideas. Different room sizes must be taken into consideration because attendees at each meeting are not always equal. Nearly one-fifth of the overall demand from the employees is to have a meeting room.

Furthermore, even though its level of satisfaction is irrelevant, an LCD monitor needs to be installed in the working area in the co-working space. In addition to the presentation equipment, the wall should be ornamented with an erasable board that enables users to take notes on the large surface of the entire side of the wall and discuss using post-its. Additionally, the use of folding transparent doors allows the conference

rooms to be adjusted to be broader or narrower in response to the purpose of use and the number of meeting attendees at once.

4.6.1.2 Hot-desk

The term “hot desk” refers to a desk and computer in an office that is available for use by any employee. One technique to make use of office building space is by using hot desks. The employees of the business can work at a shared workspace where they can share office supplies and other physical aspects without needing their own permanent workstation. Additionally, this type of environment promotes a cross-functional culture among the organization’s numerous departments (Cambridge Dictionary, 2023).

The establishment of a Wi-Fi and LAN network will enable employees to work conveniently and from any location at any time using any device. This area had a range of chairs and tables designed to encourage a diversity of work environments and spark employee creativity.

4.6.1.3 Relaxed Zone

A relaxed zone is specifically designed for employees who intend for a quick break around lunch or after work. The employees are permitted to take breaks as well as unwind in a way that makes them feel like they are at home. The seating is using bean bag seats and this area has power outlets for when they need to recharge their electronic devices.

4.6.1.4 Individual Seats

Being confined to a fixed office might occasionally make it difficult to complete jobs that requires creativity. On the other side, being around a group of people may make it harder to focus on work. Because one of the aims of co-working spaces is to foster an innovative and creative culture, the setting would foster employee creativity by providing a cross-functional setting and inspiring atmosphere. The individual chairs are the answer to this problem. The introduction of individual seats addresses the issue while also helping the employees maintain focus on their important tasks.

4.6.1.5 Recreation Zone

The employee should be permitted to take a break in between the stressful working hours in order to reduce employee stress. The recreation zone is described as a space with a noise-allowed area that was created to give people the impression that they were working from home. The room has a mini billiard game

4.6.1.6 Event/workshops/exhibitions area.

Twelve percent of the entire area is designated for activity purposes, according to the QFD. The large screen is located on one side of the room. However, because the space is intended to serve several uses, it would be necessary to reposition the hot desks in the shared common area to support the during the event.

A small locker and printing machine could be installed next to the reception to meet employee needs. Even so, the locker is optional for the co-working space service design and does not take up much room.

4.6.2 Services

The service that comprises operational hours is the appealing category for PEP Sangasanga Field employees, according to the use of QFD and the Kano Model. If these elements are not delivered, the employee will not be unsatisfied. However, if these conditions are met, the employees' satisfaction would increase enormously. From a service standpoint, by providing a good strategy for operating hours. The co-working space would more than satisfy the needs of the PEP employees.

4.6.2.1 Operating Hours

The employee is expecting to still do the work, holding meetings, and arranging events in the co-working space up until eight o'clock in the evening (8 PM). Figure 4.3 shows the data collected from the questionnaire about the frequency of PEP Sangasanga Field employee visits to the co-working space. Therefore, it is important to design a strategy for controlling operating hours in accordance with this development.

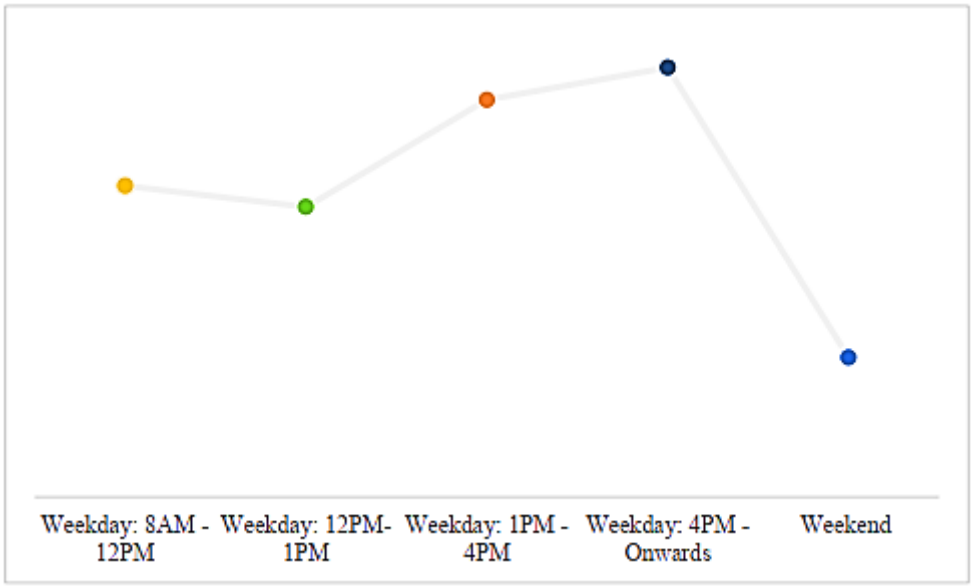


Figure 4.3. Suggested Co-working Space Open Hours

As a result, the suggested operation hours of the co-working space are on the weekdays from eight in the morning to eight in the evening in order to give food quality service. There are twelve hours of operation each day. This idea is not fixed, though. Additionally, the divisions could periodically request that co-working space be opened.

Chapter 5 Analysis and Discussion

5.1 Research Findings Analysis

Customer satisfaction is one of the most crucial things to take into account among all the relevant criteria from the standpoint of a service. Especially now that business competition is so fierce and service-related activities are crucial to creating competitive advantages for all competitors within and across industries. Service is defined as dealing with people physically and mentally. Additionally, it may be found everywhere because people are involved in everything. Therefore, the fact that every firm provides services cannot be refuted. Service systems typically relate to people's emotions and behaviors, thus there is not a single precise solution for every problem. Every firm faces a hurdle in fully understanding its customers. These days, a company could not just provide its customers with what it did best. The company must give its customers what they want most and properly satisfy them in order to outperform its competitors.

The formats of service activities are numerous. The way that is most usually used, however, is the back-office operation combined with technology, which enables all stakeholders to participate in and be involved in the business processes. In order to successfully create or improve the service, it is crucial to take into account all relevant factors.

The majority of firms use quality function deployment, or QFD, as a method to effectively identify customer needs, translate them into technical specifications, and build products and services. Given that it addresses the two most vital factors: (1) customer requirements and (2) technical requirements. It is a tool that is widely employed in product/service development. The aforementioned conditions, however, are not the only factors that would ensure the success of the firm.

Understanding how to satisfy customers will guarantee business achievement in the company. Most frequently, this technique serves as the basis for the Kano model application. The model assumes the importance of each requirement and encourages the prioritizing of all relevant issues since it is concerned with the subjective and objective views that have an impact on customer satisfaction.

The voice of the client, which needs to be trustworthy and accurate, should be the main focus of service design and management. It could not be created using an idea from the internal parties involved. The company must enquire about the opinions of its actual users. The internal stakeholders, such as engineers, designers, and programmers, must perform their responsibilities on their accountable tasks when the true requirements are specified. The error of gathering inaccurate customer requirements invariably results in the improper house of quality, which then has an impact on all processes in accordance with the QFD concept. This could lead to the creation of goods or services that fall short of customer expectations and dissatisfy the company's important clients. Finally, there is a chance that the company will fail, perform poorly, and organizations be in trouble. This study focuses on the use of QFD to improve customer satisfaction in coworking space design at a state of enterprise. Since the business is currently being disrupted by technology and the changes in workforce generation, it is important to improve organizational performance and promote a new style of working culture.

Figure 5.1 simplifies and summarizes the advantages of co-working spaces development

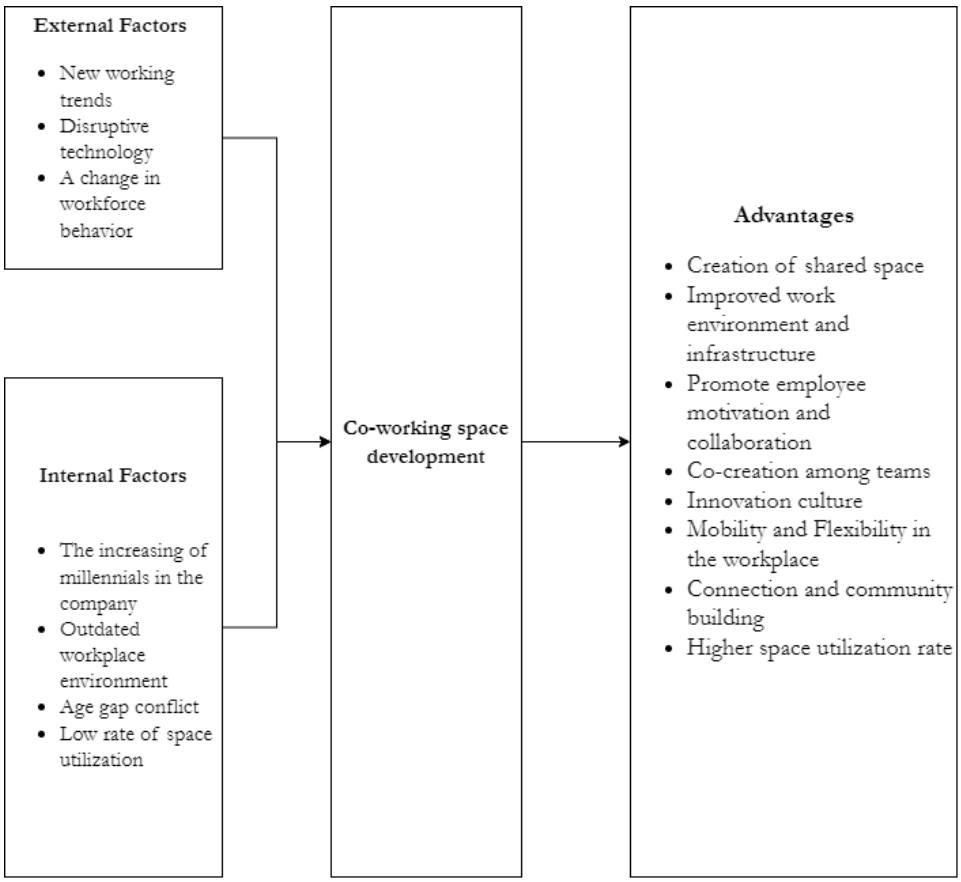


Figure 5.1. Advantages of Establishment of Co-working Space in PEP Sangasanga Field

To improve customer satisfaction, quality function deployment is used as a tool in coworking space design. The conceptual design summary is introduced by customer requirements and technical requirements as well as customer satisfaction using the questionnaire through the application of the quality function deployment and the Kano model. The area of 90 square meters currently operating as a training center is selected to be one of the options of the office renovation plan. According to the house of quality, the requirements for the room types are shown in Table 5.1.

Table 5.1. The Importance of Each Room Type

Room Type	**Employee Preference**	**Importance Weight (%)**
Group meeting area	0.86	19.47%
Hot desks	0.721	16.32%
Recreation area	0.86	19.47%
Event/workshop/exhibition area	0.535	12.11%
Relaxed zone	0.814	18.42%
Individual seat	0.628	14.21%

However, the area is not fixed and can be adapted to accommodate architectural concerns such as population circulation and environmental concerns. The equipment that should be installed in the coworking space design is the power outlet, drink vending machine and printer. These three things have such an impact on customers satisfaction. The absence is sure to dissatisfy the space users as detailed in Table 5.2

The use of these tools helps clarify and highlight the requirements for having different sorts of accommodation. The research's area usage, which is now relatively low, is one of its issues. According to the survey, the primary reason for using it at the moment is to hold team meetings. The group meeting area has the highest preference from the employee who completed the survey. As seen in Figure 5.2, conducting medical check-up services for the least amount of use. Moreover, according to the established house of quality that follows the QFD principle, it shows that the meeting room has the highest preference from the employee who completes the questionnaire.

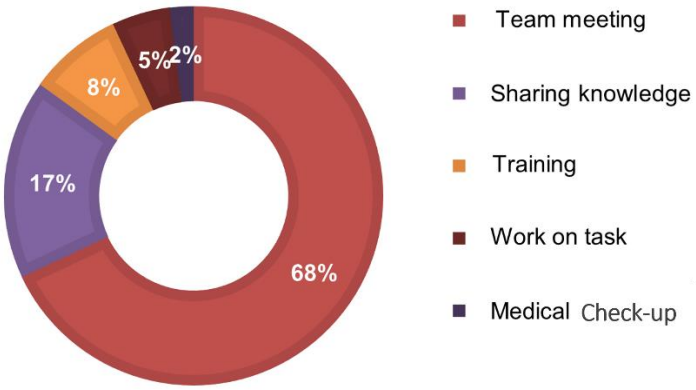


Figure 5.2. Purpose of Training Center Use

Table 5.2. Prioritization Required Components in the Coworking Space

	Technical Requirements	Kano Category	Importance Weight (%)
Facility	Power outlet at all table	Must-be	18.93%
	Drink Vending Machine	Must-be	12.60%
	Printer	One-Dimensional	1.66%
	Allocated Area	Attractive	20.32%
	Wi-Fi/LAN	Attractive	14.49%
	Book Shelf	Attractive	10.78%
	Erasable Board	Indifferent	1.63%
	Projector and LCD screen	Indifferent	1.63%
	Locker	Indifferent	3.58%
Service	Operation hours	Attractive	14.38%

The implementation of an internet network is intended to boost the area's utilization rate by drawing more users. The consumers could, however, choose between

using their personal mobile hotspot or the Wi-Fi signal offered by the cellular service providers. Furthermore, as part of the service operation strategy, service hours will be increased to be longer than regular business hours for the company. It is recommended that the area be open during the weekdays from 8 AM until 8 PM. Additionally, as the place is already a training center, it is important to continue offering services for training and sharing knowledge. However, the administration system has been modified from being online via Whatsapp to evolve into an online process that includes filling online form mechanism for booking the area for needed activities. However, visitors of the co-working facility are unaffected by their absence.

Erasable boards, projectors, LCD screens and lockers have no impact on the customer's satisfaction in this common area user, although other components do. Because of this, the development of all the aforementioned keystones undoubtedly satisfies the needs of the customer to engage in creative work, regular jobs, group meetings, self-work, interact with others, engage in hobbies, relax, and drink, as well as receive guests.

For this study, the QFD principle and the Kano model are both beneficial and are successfully combined. Both tools prevent the researcher from going in the wrong direction. Table 5.2 shows, for instance, that the importance weight of printers is a very small percentage. Without the use of the Kano Model, the printer could receive less thought and might not be mentioned in a design framework. But because it has the Kano category of one-dimension, the printer is specified.

In conclusion, this study project found that the Kano model and the use of quality function deployment help to enhance customer satisfaction in co-working space design. It demonstrates that, thanks to the existence of instruments, dealing with people's emotions and conduct in the context of a service is not very difficult. The research's main key point is to carefully consider the situation at hand and select the tools that are best suited for coming up with a solution. Additionally, it is important to consider each and every viewpoint from all parties involved. Taking into account all points of view would guarantee that the business would succeed if it could satisfy its clients.

5.2 The Organization's Co-Working Space's Conceptual Design

Facility Conceptual Design

One of the appealing aspects of service design in a co-working space is proper space allocation. According to the feedback comments obtained from the questionnaire, the area allocation could be separated into several rooms. The area's prioritization is shown in Table 5.3 with reference to employee preferences, and it was created with the presumption that each room type directly influences employee preferences.

Table 5.3. Importance of Each Room Type

Room Type	Employee Preference	Importance Weight (%)
Group meeting area	0.86	19.47%
Hot desks	0.721	16.32%
Recreation area	0.86	19.47%
Event/workshop/exhibition area	0.535	12.11%
Relaxed zone	0.814	18.42%
Individual seat	0.628	14.21%

As stated by the facts in Table 5.3, it is possible to draw the conclusion that the new allocation of the area for co-working space design in the current training center's 90 square meters. Should be created in accordance with this recommended priority. Six different room types are included in the suggested model: hot desks, individual chairs, relaxed zone, group meeting area, area for training or event, and recreation area. The three most essential items for the co-working space in the organization are a drink vending machine, power outlets and a printer. As a result, the conceptual design overview is illustrated below.

The location of the drink vending machine, which is close to the recreation and relaxed zone, is shown in Figure 5.3. This is done to make using a co-working space more convenient for the users. Additionally, a one-dimensional printer is positioned across the individual seats and hot desks to offer printing, scanning and photocopying services, as shown in Figure 5.4. However, for the power outlets that are installed at all tables within the space, you can see the installation design in Figure 5.4, Figure 5.7, and 5.13.

Figure 5.3. Drinking Vending Machine in The Relaxed and Recreation Area

Figure 5.4. Vending Machine in Recreation Area and Relaxed Area

Figure 5.5. Printing Machine

Figure 5.6. Printer Nearby Individual Seats and Hot Desks

Group Meeting Area

As a result, three rooms, shown in Figures 5.7, 5.8, 5.17 and 5.18., were created to accommodate various numbers of meeting attendees.

Figure 5.7. Small Group Meeting Room

Figure 5.8. Small Group Meeting Room

In addition, despite the LCD monitor's lack of satisfaction, it should be installed in the meeting room. In addition to the equipment for presentations, the wall should be decorated with an erasable mirror that enables users to take notes on the large area of the entire-sided wall and discuss using post-its.

Recreation Area and Relaxed Zone

Figure 5.9 depicts the recreation zone's design concept. This space is a combination of the recreation area and the relaxed zone. These two areas have adjacent levels of importance weight, and also because of the limited area, the facilities in these two areas are very supportive of one another, so the researchers decided to combine the two into 1 room. The creation of merging the relaxed zone and recreation area is taken

into consideration in order to lessen workplace stress and offer employees relaxation. This space includes a bean bag, a desk game, a mini pantry, a drinking vending machine and water dispenser.

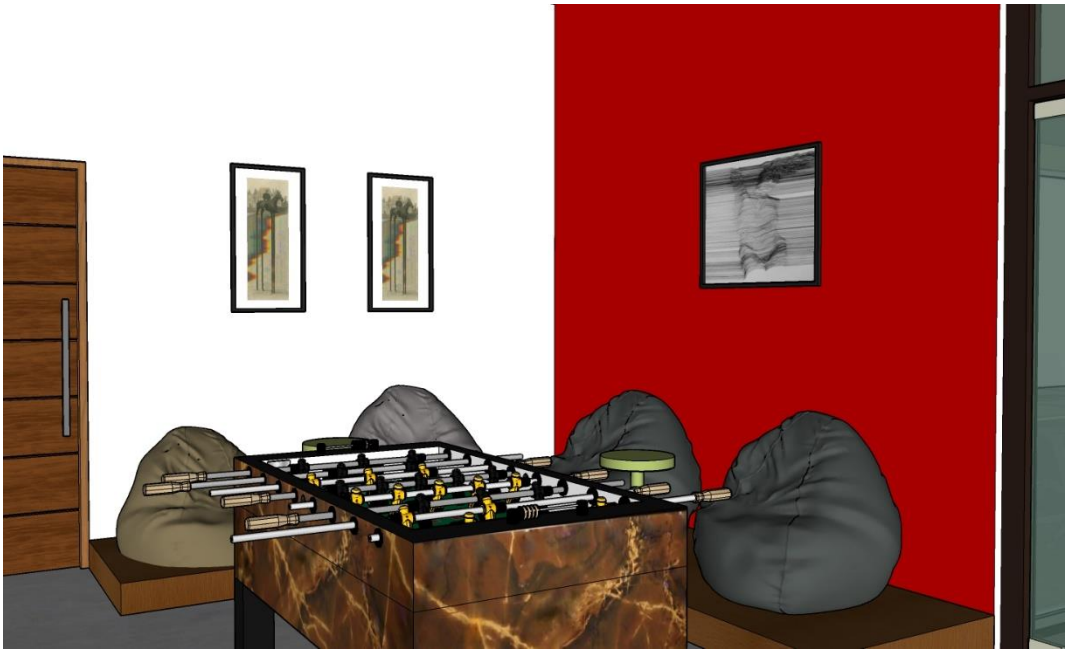


Figure 5.9. Recreation Area and Relaxed Zone

Figure 5.10. Recreation area and Relaxed Zone

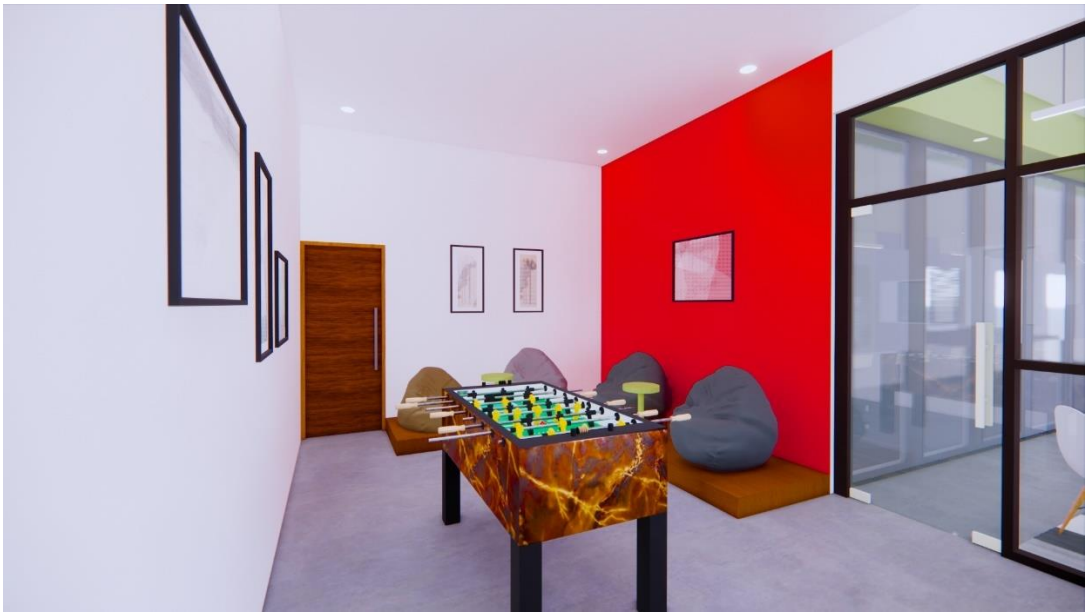


Figure 5.11. Recreation and Relaxed Zone

Hot Desks

Figures 5.12 and Figure 5.13 show how the hot desk's interiors are constructed. The area has two types of seating. This area combines wall bench couches and standard modern café chairs added with round tables for the personnel to use for their various needs.

Figure 5.12. Hot Desks

Figure 5.13. Hot Desks

Individual Seats

The individual seats in Figure 5.14 are intended for single-task, reading, and self-learning. Therefore, this area enables visitors to focus on their own tasks without being distracted by others. This area may support the current situation in the organization, where the level of short-term focus among employees is very high. The desks are also equipped with power outlets.

Figure 5.14. Individual Seats

Figure 5.15. Individual Seats

Figure 5.16. Power Outlets in the Individual Seat’s Desk

Event / Training Room

The concept layout for the designated space for the event room is shown in Figure 5.17. It is located close to the hot desk zone. The furniture in the space should be simple to move and easily transportable. That is why the chairs with rolling wheels are selected. Additionally. The location might occasionally decorated depending on the type of training, event, sharing knowledge or workshop. This area can also be utilized

for meeting with larger participants. In addition, this room in Figures 5.17 and 5.2.14 are also flexible and can be combined to create a broader conference area because they are divided by a folding transparent door partition.

Figure 5.17. Event, Workshop and Sharing Knowledge Room

Figure 5.18. Interior Design of Event, Training and Sharing Knowledge Room

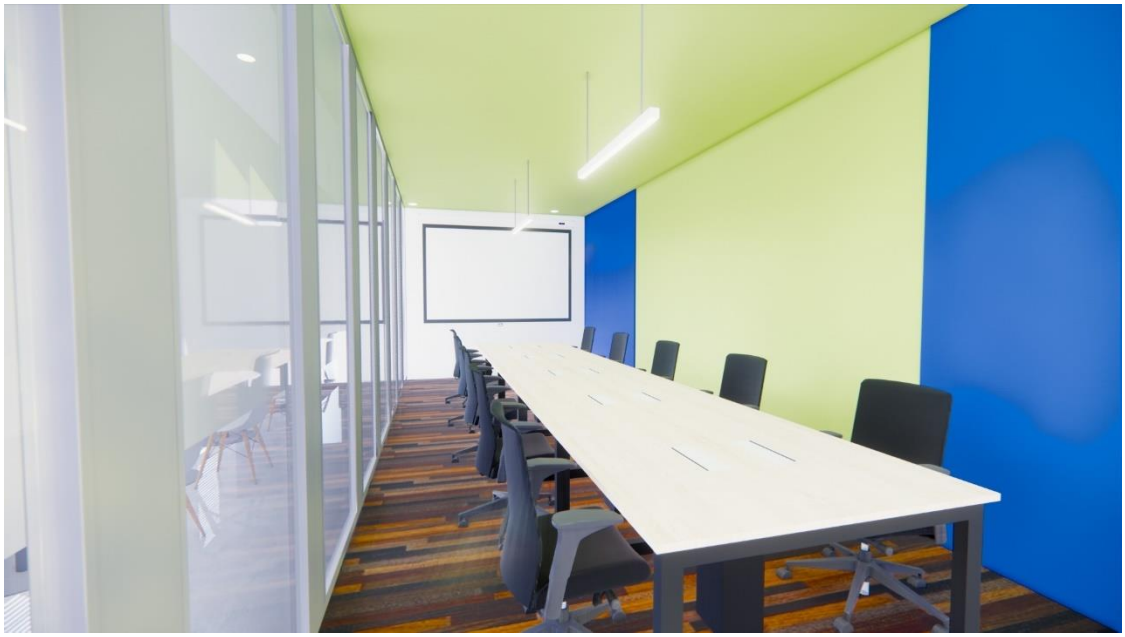


Figure 5.19. Interior Design for Event, Training and Sharing Knowledge Room

Reception Counter

The reception desk, shown in Figure 5.20, is located at the co-working space entry closest to the front door in order to give information to all visitors. In addition, it is where the employees register the booking and reservation.

Figure 5.20. Reception Counter

Co-working space Full Layout

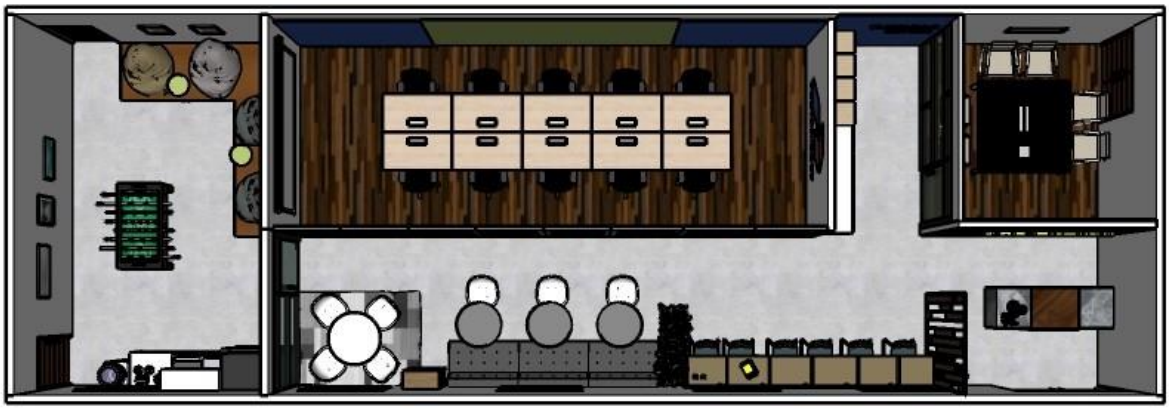


Figure 5.21. Full Layout

Proposed Name of Co-working Space

The proposed name for the coworking space for the PEP Sangasanga field organization is '135 Energy'. The researcher chose the name considering 135 is the Pertamina Call Center. Pertamina Call Center 135 will serve the public who need information about Pertamina products, and serve community input regarding services, and information regarding Pertamina's promotional programs such as company programs which are currently still running, you can ask through Call Center 135. Another implied meaning of 135 is explained below:

- 1 represents the spirit of 'One Energy, One Pertamina' which synergizes all energy supply activities in a more focused and directed manner so that it will build a major force in the energy sector that can enable the group of companies to have a greater impact on various efforts to address challenges related to future energy needs .
- 3 symbolizes the Pertamina EP logo which has three colours
- 5 represents 5 critical behaviors in Pertamina EP. It is also called 'C5B'. C5B in
    1. Dare to make decisions quickly and accurately based on measured risks (COMPETENT)
    2. Responsible for tasks, decisions and actions taken to completion (AMANAH)
    3. Adhere to moral and ethical values (AMANAH)

4. Synergize aggressively to provide maximum added value for the company and other stakeholders (COLLABORATIVE)
5. Finding the best solution in dealing with differences in interests that occur (COLLABORATIVE)

5.3 Limitation of the Research

This research has been carried out in accordance with scientific procedure, however, still has limitations, namely:

1. While this research prioritizes meeting customer needs and ensuring the quality of the coworking space design by identifying the facilities and services that will meet customer expectations and improve employee satisfaction, it does not take into account the cost considerations associated with implementing the design features. Emphasize that the absence of cost analysis is an important limitation, as cost is a critical factor in practical design and implementation. A well-designed coworking space should not only meet user requirements but also be financially feasible for the stakeholders involved. There may be potential challenges that could arise, such as budget constraints, difficulty securing funding, or the need for compromises that may impact the overall quality of the space.
2. In this research, the conceptual design focuses more on the placement of facilities, interior design and full layout of the coworking space, this research did not consider environmental responsibility. Environmental responsibility. PEP Sangasanga Field as the oil and gas industry is often associated with environmental concerns due to its impact on ecosystems and natural resources. By incorporating green materials in the design of the coworking space, the company can demonstrate its commitment to environmental responsibility and sustainability. Incorporating these materials can enhance the company's image and reputation, showcasing it as a forward-thinking and environmentally conscious organization. Green materials are often designed to be more resource-efficient, using renewable or recycled materials. This can reduce the overall environmental footprint of the coworking space's construction and operation. By incorporating green materials, PEP Sangasanga Field can position itself as a leader in adopting sustainable practices within an industry that traditionally faces sustainability

challenges. Here are some examples of green materials that can be considered incorporated into the design of a coworking space:

Table 5.4. Examples of Green Materials

Examples of Green Materials to Be Considered for Co-Working Space in PEP Sangasanga Field	
Bamboo Flooring	Bamboo is a rapidly renewable resource that can be used for flooring. It's durable, attractive, and has a lower environmental impact compared to traditional hardwoods.
Recycled Glass Countertops	Countertops made from recycled glass are visually appealing and help divert glass waste from landfills.
Low-VOC Paint	Volatile Organic Compounds (VOCs) are harmful chemicals found in many paints. Low-VOC or zero-VOC paints release fewer toxins into the air, improving indoor air quality.
Cork Wall Panels	Cork is a sustainable material harvested from the bark of cork oak trees. It's renewable and can be used for wall panels, providing sound insulation and a unique texture.
Reclaimed Wood	Using reclaimed wood from old structures or pallets reduces the demand for new timber and gives a rustic, unique character to the space.
Recycled Metal	Incorporating recycled metal into furniture or decorative elements can add an industrial and eco-friendly touch to the coworking space.
Natural Fibre Carpets	Carpets made from natural fibres like wool, sisal, or jute are biodegradable and have a lower environmental impact compared to synthetic carpets.

LED Lighting	LED lights are energy-efficient and have a longer lifespan than traditional bulbs, reducing energy consumption and maintenance costs.
Bioplastics	Bioplastics are made from renewable resources like cornstarch or sugarcane. They can be used for furniture components or accessories.
Solar Panels	If feasible, solar panels can be installed on the roof to generate renewable energy for the space.
Living Green Walls	These walls are covered with plants that provide improved air quality, insulation, and a visually appealing natural element.
Recycled Metal or Glass Patitions	If the partitions are needed in the coworking space, consider using recycled metal or glass to maintain an open and transparent feel.
Energy-Efficient Windows	Windows with energy-efficient glazing can reduce heat loss in the winter and heat gain in the summer, resulting in lower energy consumption for heating and cooling.
Rainwater Harvesting System	If applicable, a rainwater harvesting system can be used to collect rainwater for irrigation or flushing toilets.

The suitability of these materials depends on factors like the design aesthetic, budget, local availability, and specific requirements of the coworking space from PEP Sangasanga Field. It is a good idea to work with architects, designers, and suppliers who specialize in sustainable design to ensure the best choices for your project.

Chapter 6 Conclusion

The research on the topic of quality function deployment for improving customer satisfaction in coworking space design is concluded in this chapter, along with suggestions for future work.

6.1 Conclusion of the Research

As mentioned in Chapter 1, there are five trends that are influencing the workplace of the future. These developments can be divided into two categories: those linked to technology and those relating to people. By putting an emphasis on people, the working environment is changing as a result of new workforce habits, particularly those of millennials who are joining the workforce and establishing a new style of working. Additionally, the majority of organizational personnel emphasize their desire to work whenever, wherever, and on any device. Global connectivity and the exploding use of social media are also causing disruptions in the workplace in terms of technology. As a result, the majority of authorities are having trouble adjusting to these challenges, which are primarily brought on by the younger generations who have lately been hired into the companies. Furthermore, it appears to be challenging for the authorities to turn a profit and endure in a highly competitive environment while wanting to expand their business while continuing to operate according to conventional procedures and excluding external situations.

The co-working environment is acknowledged as one of the useful strategies for encouraging an organization toward creativity and innovation, which would then contribute to the expansion and sustainability of the company. It is also one of the methods for helping the organization adapt to new working trends. This study was done to provide an answer to the research question: “What facilities should be offered in a co-working space in a state enterprise, PEP Sangasanga Field, and what are the suggested services in order to strategically for the needs of the employees and the emerging trends?”

It is undeniable that the working environment preferred by the majority of young employees has changed from the traditional office layout into a common shared area as a result of the elderly retiring from many organizations and being replaced by recent graduates or members of the millennial generation. The case study for the

research project is the state-owned oil and gas company PEP Sangasanga Field. With the supporting problems currently being faced by the company, which is the age gap conflict, a supportive strategy is needed to overcome this problem. An online survey is undertaken before the creation of the House of Quality to gather employee feedback, which is then converted into employee requirements. Employees from all deputies who work in the headquarters and provincial sites and are between the ages of 26 and 60 make up the questionnaire's responses.

According to the results of the study, most employees are unimpressed with the way things are done in the office. However, they would be interested if the company created a co-working space at its office. The major goals of use include carrying out ordinary and creative tasks alone, holding group meetings, making colleagues from related or unrelated areas, and taking a break from demanding work. Therefore, in order to offer comfort while working as well as effectiveness and productivity, facilities must be provided. In this study, each table must have a power outlet installed, and the co-working space must have a drinking vending machine. The consumers of the coworking space would not be satisfied even if these two facilities were there, but they would be unhappy without them. Another facility that should not be overlooked is the printer, which is one of the ones listed as a one-dimensional requirement. Employees at the co-working space would be happy to have a printer there. Contrarily, its lack would result in discontent. The design framework also lists the internet access channel, locker, erasable board, and projector with LCD screen as additional components. More people would enter the coworking space if these items were there. However, the employees would not be unhappy if it were not there.

The preferred operating hours of the facility for back-office operations are from eight in the morning to eight in the evening. The benefit of working these long hours is that the staff member can put in more time in a shared area. The employees would have time to interact with and learn from individuals from different departments, forming a cross-functional community within the company. The action unquestionably improves teamwork and relationships both inside and between teams.

Since the service for meeting, training and sharing knowledge is still needed, but managed differently, technology is involved in this step. It is necessary to establish an online platform for reserving the area in the co-working space. The use of digital

tools would reduce the amount of excess crowd and schedule overlap and promote floor space optimization.

All of the previously mentioned elements are similar to puzzle pieces. They produce efficient co-working space service design and improvement when they are fully interlocked. They are the essential components of co-working space design that would be strategically matched to the requirements of the employee and the most recent trends.

6.2 Upcoming Work Recommendation

However, this recommended design could be used as a case study for co-working space establishment in other PT. Pertamina EP Assets locations across the country. The conceptual design of the co-working space in the area of the existing training center has been introduced. Even after extensive research, there is still potential for improvement in the co-working space design and customer satisfaction.

First, based on the factual data, this research has proposed a strategic direction for customer satisfaction improvement. However, service systems frequently connect to intangible elements like people's perspectives, satisfactions, emotions and behavior that cannot be quantified statistically. The analysis of the subjective data could strengthen the strategy and highlight the co-working space's success story while also improving customer satisfaction, providing a better work environment, promoting a sense of internal community, and encouraging an innovative culture.

Second, future researchers can propose integrating cost analysis methodologies (e.g., cost estimation, budget allocation) into the QFD process. In addition it discusses how such approach could result in more balanced and realistic designs that consider both quality and cost factors.

Third, to increase the rate of space usage, internal events like entrepreneurship, soft skill workshops and innovation competitions might be introduced. This would motivate employees to use the co-working space. The KORIDOR Co-working space is an example of this situations. KORIDOR organizes various activities such as startup training and animation workshops that encourage the creativity of its members. So, by

using such creative programs, PEP Sangasanga Field could also provide good service that will satisfy their employee even more.

Fourth, in terms of energy use, the co-working facility would benefit the company. Less energy is used compared to when all of the rooms in the building switch in all of the lights and air conditioners since it allows the employees to work in a shared space. However, the strategy, policy, and guidelines should be made explicit in order to protect chaotic co-working space management and to prevent overcrowding during rush hour.

Fifth, the agreement and payment to the employee member who is in charge of maintaining the area should be considered since it must be open outside regular business hours. In PEP Sangasanga Field, the current administrator for the training center is the Human Capital department. This covers the wages paid for overtime work as well as the employee member's shift schedules. The team's leaders must establish proper management and come to an agreement.

Sixth, it is possible to use the current technology and digital tools. For instance, the company may create an online form or online website for its accommodation reservation system. Implementing online communities like forums or live chat would improve people's ability to communicate.

Last but not least, managers in all line functions must encourage their employee to use the co-working space rather than making them sit at their desks and work on their routine tasks. Organizational policy has to be updated to enhance interpersonal interactions, assist cross-department collaboration, foster creativity, and promote co-creation and division collaboration.

There are numerous examples of co-working space management that have been effective in multinational corporations. The organization that conducted the investigation might compare itself to others and benefit from current coworking space providers. To fit the organizational culture and employee needs, the business must, nevertheless, customize the service management, design, and build its own uniqueness for the co-working space.

APPENDIX

Appendix A

Questionnaire

QUALITY FUNCTION DEPLOYMENT FOR IMPROVING SERVICE QUALITY IN CO-WORKING SPACE DESIGN

Survey ini merupakan bagian dari thesis yang diajukan untuk memenuhi sebagian persyaratan memperoleh gelar sarjana program studi Teknik Industri Internasional Program, Universitas Islam Indonesia.

Judul Penelitian: Quality Function Deployment for Service Quality Improvement in Co-working Space Design (case study : PT. Pertamina EP Field Sangasanga)

Survei ini bertujuan untuk mensurvei kebutuhan pelanggan pada co-working space di suatu organisasi untuk meningkatkan desain layanan. Partisipasi dalam penelitian ini bersifat sukarela dengan jaminan bahwa tidak ada konsekuensi negatif yang dapat timbul dari penolakan partisipasi Anda. Data akan dikoreksi secara anonim. Silakan jawab berdasarkan pengalaman Anda bekerja di organisasi.

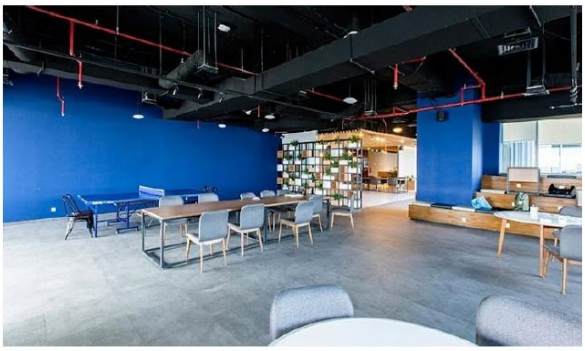
* Menunjukkan pertanyaan yang wajib diisi

1. Apakah Anda puas dengan kantor Anda saat ini? *

   Tandai satu oval saja.

   - ◯ Sangat Puas
   - ◯ Puas
   - ◯ Tidak merasa puas tidak juga kecewa
   - ◯ Tidak puas
   - ◯ Sangat tidak puas

2. Jika organisasi memiliki ruang kerja bersama (co-working space), bagaimana perasaan Anda? *



   Tandai satu oval saja.

   - ◯ Saya menginginkannya
   - ◯ Sudah seharusnya diadakan di tempat kerja
   - ◯ Netral
   - ◯ Tidak perlu, tapi jika ada tidak apa apa
   - ◯ Saya tidak menginginkannya

3. Apa tujuan Anda mengunjungi co-working space? (Bisa pilih banyak jawaban) *

Centang semua yang sesuai.

- [ ] Melakukan pekerjaan rutin
- [ ] Meeting dengan tim
- [ ] Melakukan pekerjaan kreatif
- [ ] Membaca mandiri (self-reading)
- [ ] Belajar mandiri (self-learning)
- [ ] Beristirahat / bersantai
- [ ] Minum (kopi, teh, dll)
- [ ] Membangun komunitas
- [ ] Melakukan hobi
- [ ] Yang lain: _____

4. Menurut Anda, jam berapa Anda akan menggunakan co-working space? (Bisa pilih banyak jawaban) *

Centang semua yang sesuai.

- [ ] Di pagi hari (Hari Kerja: 08.00 – 12.00)
- [ ] Selama istirahat makan siang (Hari Kerja: 12.00 – 13.00)
- [ ] Sore hari (Hari kerja: 13.00 – 16.00)
- [ ] Setelah jam kantor (Hari kerja: 16:00 dan seterusnya)
- [ ] Weekend (Sabtu – Minggu)

5. Apa jenis ruang yang Anda sukai? (Bisa pilih banyak jawaban) *

Centang semua yang sesuai.

- [ ] Group meeting area

- [ ] Hot desks

- [ ] Recreation area

- [ ] Events / workshop / exhibition area

- [ ] Relaxed zone

- [ ] Individual seat
- [ ] Yang lain: _____

6. Di ruang kerja bersama, bagaimana perasaan Anda jika Anda _____? *

Notes:
1: Sangat memuaskan
2 : Wajib ada
3 : Biasa saja
4 : Tidak puas
5 : Sangat tidak puas

Centang semua yang sesuai.

	1	2	3	4	5
Dapat melakukan aktivitas yang Anda sukai di ruang kerja bersama	☐	☐	☐	☐	☐
Bisa bekerja sendiri tanpa membuat kebisingan	☐	☐	☐	☐	☐
Bisa print atau fotocopy di tempat	☐	☐	☐	☐	☐
Menyelesaikan pekerjaan, dicetak di tempat lain	☐	☐	☐	☐	☐
Bisa mengambil minuman tanpa meninggalkan area	☐	☐	☐	☐	☐
Membawa minum sendiri dari luar	☐	☐	☐	☐	☐
Dapat menitipkan barang-barang Anda	☐	☐	☐	☐	☐
Harus membawa barang-barang anda	☐	☐	☐	☐	☐
Akses internet melalui Wi-Fi / LAN	☐	☐	☐	☐	☐
Akses internet melalui hotspot pribadi	☐	☐	☐	☐	☐
Dapat mengisi daya perangkat elektronik di meja	☐	☐	☐	☐	☐
Mengisi daya perangkat elektronik di titik pengisian daya/stop kontak	☐	☐	☐	☐	☐
Buat catatan di papan yang bisa dihapus	☐	☐	☐	☐	☐
Menulis catatan di buku catatan Anda	☐	☐	☐	☐	☐
Mempresentasikan file menggunakan file elektronik melalui komputer	☐	☐	☐	☐	☐

file elektronik melalui komputer	☐	☐	☐	☐	☐
Individu membawa laptop / tablet dan presentasi sendiri untuk rapat	☐	☐	☐	☐	☐
Dapat menggunakan ruang kerja bersama kapan pun Anda mau	☐	☐	☐	☐	☐
Harus mengunjungi ruang kerja bersama hanya di jam kantor saja	☐	☐	☐	☐	☐
Dapat membaca dengan bacaan buku yang disediakan	☐	☐	☐	☐	☐
Membawa bacaan pribadi	☐	☐	☐	☐	☐

7. Saran lebih lanjut yang Anda miliki untuk desain co-working space di organisasi

Bagian Tanpa Judul

8. Berapa umur Anda? *

Tandai satu oval saja.

- Kurang dari 26 tahun
- 26 – 40 tahun
- 41 – 55 tahun
- Lebih dari 55 tahun

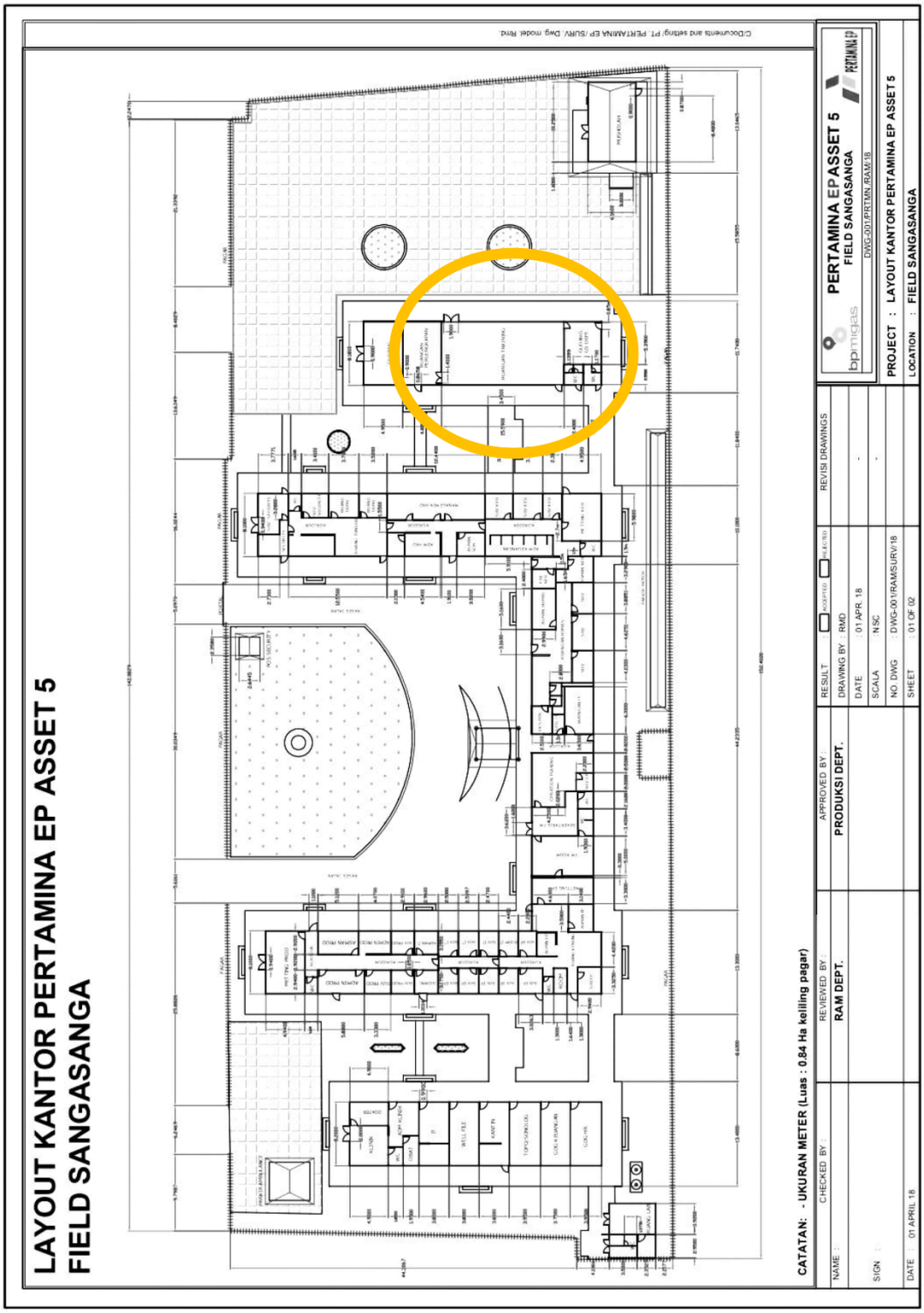
9. Apa divisi anda di organisasi? *

Tandai satu oval saja.

- RAM
- SCM
- WOWS
- HSSE
- Production & Operation
- Petroleum Engineering
- Finance
- ICT
- Administrative (Legal Relation, Finance)

Appendix B

Company's Layout



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