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ASSESSMENT AND IMPLEMENTATION OF KNOWLEDGE MANAGEMENT TO INCREASE DIGITAL TALENTS AND INNOVATION IN SUB-DIRECTORATE XY TELKOMSEL

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ABSTRACT: *The background of this research is the innovation rate in the sub-directorate XY is low compared to the other sub-directorate. To answer that issue, research is conducted to assess the knowledge management maturity level in sub-directorate XY and propose Knowledge Management design and implementation to increase digital talents and innovation in sub-directorate XY. The research used mixed methods by conducting a survey of all employees under sub-directorate XY and semi-structured interviews with senior leader's representatives and finally using data triangulation to combine the quantitative and qualitative analysis. The analysis showed that the sub-directorate XY KM Maturity level is in the refinement stage where Knowledge Management is continuously evaluated and improved. As a lesson learned from previous knowledge management implementation to make it more effective, sub-directorate XY must focus on nurturing a culture that focuses on continuous learning and sharing activities, resource allocation to manage the knowledge management processes, i.e., specific teams and budget allocation. A presence from senior leaders who continually promote the importance of knowledge management also should be consistently conducted in sub-directorate XY. And finally, the KM tools and framework can be built to support and accelerate the KM processes.*

KEYWORDS: *Asian Productivity Organization, Digital Talent, Innovation, Knowledge Management, Knowledge Maturity Level*

I. INTRODUCTION

Telkomsel, a part of Telkom Group, has developed a corporate strategic plan to aimed at achieving continuous and sustainable revenue growth until 2026. In order to reach this goal, Telkomsel is confronting various challenges inherent in the telecommunications industry business landscape, both in Indonesia and globally, where growth needs to be enhanced. To secure the future growth, Telkomsel has implemented numerous strategies, with a strong emphasis on elevating its digital business services revenue as a new source of income. Telkomsel's put digital transformation as their corporate theme in 2021: "Strengthen business health and accelerate digital transformation to smartly cope with changing customer behaviour". One of the keywords is "Digital Transformation" which supported also by Telkomsel's main programs in 2021: Accelerate transformation to lead in the digital space and more robust customer engagement and leverage and unlock group potential to increase corporate value.

Based on a study, digital transformation is not only about advanced technology, it is more complex beyond that, which needs to address strategic roles of new digital technologies and capabilities for successful digital innovation in the digital world (Helmy Ismail Abdelaal et al., 2018). Therefore, Telkomsel must focus on and prioritize digital talent and business issues than technology aspects to compete in the digital age (Kane, 2019).

Telkomsel's digital transformation journey heavily relies on people (digital talents, digital skills, digital capabilities, and digital readiness) and culture (digital environment) to achieve our goals in the following digital era. These digital capabilities readiness will determine whether Telkomsel businesses will survive and adapt to digital technology disruption or other digital companies will disrupt it. To anticipate the digital disruption, Telkomsel is committed to better preparing its digital talents by enhancing their soft and hard skills that will drive new ideas and innovative products. Based on a paper from Achmad Fajar Hendarman & Uwe Cantner, soft skills and hard skills are significantly and positively associated with individual level of innovativeness (Hendarman & Cantner, 2018).

One of the outputs from Telkomsel's digital talents is innovation. Innovation is a key success factor for Telkomsel and Telkom group to be sustainable in the future. Based on PwC research in 2013, innovation is a driver for rapid and profitable revenue growth, but it can also deliver improved competitive positioning, higher

customer satisfaction, and decreased costs (Price Waterhouse Coopers, 2013). Innovation is the only way for Telkomsel and Telkom group to be a competitive edge in digital business competition.

To keep innovative and stay relevant in this digital era, Telkomsel has organized an annual innovation program called the Polaris program, which encourage employees to submit their ideas to the company. The program has two categories: new business innovation and new internal process innovation. The new business innovation category aims to capture new business opportunities by developing new products and businesses in Telkomsel to remain relevant and competitive in the current digital and telco business landscape. Meanwhile, the new internal process category aims to improve existing business processes to increase Telkomsel's revenue or reduce its costs in the future.

II. LITERATURE REVIEW

II.1 Theoretical Foundation

II.1.1 Knowledge Management and Digital Business Transformation

Telkomsel and Telkom Group are embarking on an exciting journey to unlock their immense digital potential through comprehensive digital business transformation. As mentioned previously, one area of improvement for Telkomsel and the Telkom group is the development of digital talents to support digital transformation. To support that, researcher found a literature review that has already been conducted previously related to how knowledge management can accelerate digital transformation in the organization.

This research was published in 2022, by Vanja Erceg and Tihomir Zoranovic, from the University of Novi Sad, Subotica, Serbia (Erceg & Zoranović, 2022). They start their research with the business problem of increasing market share in the digital age and companies should react quickly when new business opportunities arise. To take action as quickly as possible, the company's employees must be qualified and able to use modern technologies, which can drive process automation. And these factors lead to how a company's knowledge management can provide the necessary knowledge to make business decisions.

II.1.2 The relationship between knowledge management and innovation

Innovation is the key for Telkomsel and Telkom Group to explore the unlocked Telkom Group digital businesses to elevate the digital businesses' s revenue. Innovation is the application of knowledge to produce new knowledge (Drucker, 1993). Hence, better use of existing knowledge and more effective acquisition and assimilation or new knowledge becomes the business imperative (Thurow, 1996). "Increasingly, developing and managing human intellect and skills, more than managing and deploying physical and capital assets, will be the dominant concern of managers in successful companies" (Quinn, 1992).

Another research explains how knowledge management and innovation is have a positive correlation with each other. In this research, researcher trying to analyse how to develop innovation based on organizational vision and knowledge management i.e., facilitating the development integration and application of knowledge. The paper elaborates on an organization vision and how it is connected to support organizational innovation with below flow.

A clear corporate vision directs knowledge management which involves facilitating the development, integration, and application of knowledge. This involves focusing on what kind of knowledge is critical for innovation. Furthermore, this research emphasizes a dependence on building individual and team-networks (internally and externally) to help ideas flow and develop, integrate, and use the new knowledge. Based on this research, we can conclude that starting with a clear vision that support and appreciate knowledge management, a well-developed, integrated, and continuously improved knowledge management implementation that can drive and motivate employees to be more collaborative in doing knowledge development, knowledge integration, knowledge application in their daily basis. The output from this behaviour is the implications for organizational innovation which introduce a high degree of innovation.

II.1.3 House of Knowledge Driven Organization (Jann Model)

House of knowledge-driven organization Jann Model is one of the KM Framework that shows how degrees of innovation in the organization are driven by the implementation of knowledge management, and this knowledge management itself is driven by the degrees of learning organization of an organization. This framework model is built with a two-floored house. The first-floor area shows the learning organization as a foundation to support the second floor as a knowledge management area, and the roof, or we can call it an outcome, is a knowledge for innovation.

On the first floor, the learning organization area explains that organizations where people are learning together, continually expand their capacity to create the results they genuinely desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together (Senge, 2004). This learning organization relied on several factors shown in the framework, which consists of mutual trust and learning culture, knowledge worker, and learning facilities. In this area, Jann also states all interaction inside the learning organization named learning enabler. In an extreme

way of thinking, as this first floor is the foundation of the house itself, once this learning organization does not exist, the knowledge management and the innovation will also be falling apart.

After we make sure the first foundation, the foundation of our house (organization), is well-built and robust enough, it's time for us to build the second floor (knowledge management area). In this area, Jann mentioned the output is a smart and agile organization that consists of and is supported by KM tools and KM methods. All interactions in this area are called KM processes.

This implementation of the first floor (learning organization area) and second floor (knowledge management area) will determine the learning habit (knowledge to innovation), which Jann called knowledge-driven enterprises, the enterprise driven by knowledge to boost innovation, taking business decisions, and doing all things related the organization or enterprise activity.

II.1.4 APO Knowledge Assessment Tool

APO knowledge assessment tool is a survey questionnaire designed to help organizations conduct a rapid initial assessment of their readiness for KM. The assessment is carried out at the beginning of the KM program. Before starting the KM journey, the organization needs to know its strengths and opportunities for improvement. The organization can then focus on its KM programs to address the gaps identified through assessment. The APO KM assessment tool is based on the APO KM framework. The questions in the tools are based on seven framework elements.

The starting point for the APO KM Framework is understanding the organization's vision, mission, business goals, and strategic directions. This helps the organization identify and analyse its core competencies and capabilities and which areas it needs to develop. The four accelerators can help understand to what extent these drivers and enablers are prevalent in the organization so that a successful KM implementation can be launched. The five core Knowledge Processes provide an initial assessment of existing practices related to KM, which can be leveraged during implementation. Organizations may sometimes already be practicing KM without realizing it. The outcomes of KM efforts measure the effectiveness of the knowledge processes supported by critical success factors (accelerators, vision, and mission). The outcomes must demonstrate enhancement of learning and innovation that build individual, team, organizational, and societal capabilities and ultimately lead to improvements in quality of products and services, productivity, profitability, and growth.

The APO KM assessment tool has seven audit categories based on the critical elements of the framework: KM leadership, process, people, technology, knowledge processes, learning and innovation, KM outcomes. There are 42 questions covering the seven audit categories, with a maximum score of 210 points. Each category has a maximum score of 30 points. Each of the questions can be rated from 1 (doing poorly or nothing at all) to 5 (doing very well). Based on this assessment, the total score is then compared to the KM Maturity Model and shows the KM maturity level of the organization.

II.1.5 APO KM Implementation Approach

APO KM Implementation approach using APO Framework divided into 4 steps which, also known as "4DS" i.e.: Discover, Design, Develop and Deploy. Discover process is the first step to identify the needs and knowledge gaps (Sensuse & Rohajawati, 2013). This step identified knowledge needed to build organizational competencies by matching the needs with available knowledge in the organization and then identified gaps. In discover step, researcher can use Organization Knowledge Management Readiness Assessment using APO Framework to assess the current KM Maturity level.

Design process is the next step to design a pilot project was the result of the identification in the discover step. Pilot KM projects are designed based on the output from discover step, which aim to increase the organization's current KM Maturity level. In the design process, set of improvement action with its timeline will be decided.

Develop process is the process of implementing KM pilot project. In this stage, several initiatives in several categories already designed in the design process will be executed based on the timeline. In this stage is known as the implementation of pilot projects we conduct an evaluation process of the pilot projects and the output will be used in the next step.

Deploy process in the APO KM Implementation approach is the last step. During this step, the KM implementation will be continued to wider application and wider organization. Several stakeholders will decide to which area the KM implementation will be applied and start again in the discovery step. This whole process will be a loop process from discover step until the deploy step and continue to the next loop to improve the KM effectiveness in the organization

II.2 Conceptual Framework

A conceptual framework is a synopsis of various findings from the literature sources that have been reviewed about the research, setting out the research agenda for increased understanding of the research intentions. The understanding is achieved by providing a structure that organizes the current thoughts that provide focus and direction to an inquiry (Shikalepo, 2020). In this research, a conceptual framework is built by study literature process in chapter 2.

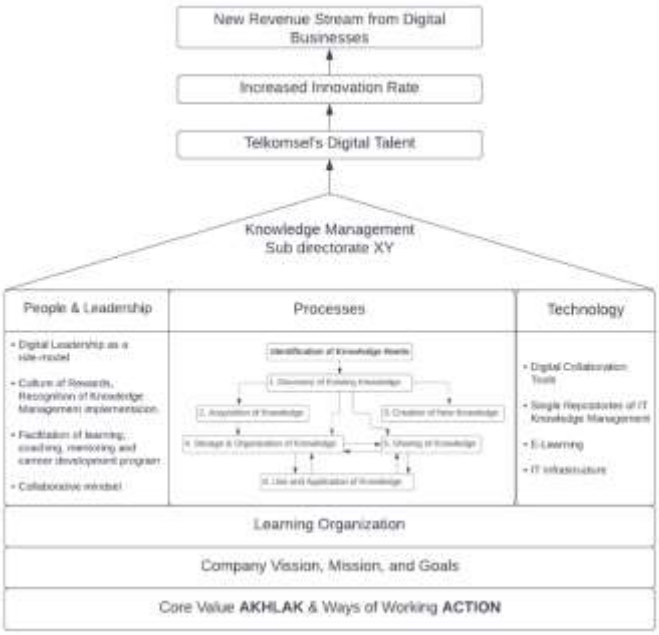

Figure II.1 Conceptual Framework (Che Rusuli & Tasmin, 2012; Author, 2023)

III. RESEARCH METHODOLOGY

Research methodology is a science of studying how research is done scientifically. A way to solve the research problem by logically adopting various steps (Patel & Patel, 2019). In this chapter, research methodology is divided into several sub-chapter like research design, data collection method, and data analysis method.

III.1 Research Design

The research design of this final project will use the explanatory sequential mixed method considering the primary data is coming from a quantitative approach by evaluating KM maturity assessment via a questionnaire to all sub-directorate XY employees. The following sequence after quantitative data has been analyzed is to collect the data from a qualitative approach by interviewing several stakeholders like senior leaders, knowledge workers, and subject matter experts to complete the further exploration from initial quantitative data (Creswell, 2014).

III.2 Data Collection Method

This research utilizes a mixed method to gather qualitative and quantitative data. Mixed methods research is an approach to an inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may include philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone (Creswell, 2014).

III.2.1 Quantitative Approach: Questionnaire

The data collection quantitative approach will use a questionnaire survey to all sub-directorate XY employees. The questionnaire uses online tools called Microsoft forms, linked to the respondent's email, and consist of 40 questions about knowledge management maturity assessment using APO framework. In knowledge management maturity assessment using APO Framework, 7 categories need to be assessed and evaluated consisting of leadership, process, people, technology, knowledge process, learning and innovation, and KM outcomes, and for each category, there are six questions that need to be scored by respondents (sub-directorate XY employees) between 1 to 5. Score 1 represents the lowest score indicating that organization is doing very poorly or doing nothing at all, and score 5 represents the highest score indicating the organization is doing very well for the category in question. The total score of all questions will be used to determine the organization's knowledge management maturity level with the below category:

Table III. 1 KM Maturity level

Total Score	KM Maturity Level	Characteristic

42 - 83	Reaction	Organization not aware of what KM is and its importance in enhancing productivity and competitiveness
84 – 125	Initiation	Organization beginning to recognize the need to manage knowledge
126 – 146	Introduction (expansion)	KM practices in some areas
147 – 188	Refinement	KM implementation is continuously evaluated and improved
189 – 210	Maturity	KM is mainstreamed in the institution

Table III. 2 APO Survey questionnaire question

Category	Questions	Nomenclature
Leadership (LDR)	The company has knowledge management (KM) strategy linked to the company vision and mission.	LDR1
	The company is organized to accommodate knowledge management initiatives/activities (i.e., central coordinating unit for knowledge/information management, Chief knowledge/information Officer, ICT team, quality improvement teams/communities of practice, knowledge networks)	LDR2
	Financial resources are allocated for knowledge management initiatives.	LDR3
	The company has a policy for safeguarding knowledge (i.e. copyrights, patents, and knowledge security policy)	LDR4
	Managers become the role-model to the values of knowledge sharing and collaborative working. They spend more time disseminating information to their staff and facilitating the horizontal flow of information between their staff and with staff of other departments/division/unit.	LDR5
	Management promotes, recognizes, and rewards: performance improvement, organizational and employee learning, sharing of knowledge and innovation.	LDR6
Process (PRO)	The company determines its core competencies (strategically important capabilities that provide a competitive advantage) and aligns it to their mission and strategic goals.	PRO1
	The company designs its work systems and procedure to create value to customers and achieve performance excellence.	PRO2
	New technology, knowledge shared in the company, flexibility, efficiency, and effectiveness are factored into the design of processes	PRO3

	The company has an organized system for managing crisis situations or unforeseen events that ensures uninterrupted operations, prevention, and recovery.	PRO4
	The company implements and manages its key work processes to ensure that customer requirements are met and business results are sustained.	PRO5
	The company continually evaluates and improves its work processes to achieve better performance, to reduce variations, to improve products and services, and to be updated with the latest in business trends, developments, and directions.	PRO6
People (PPL)	The company's education, training, and career development program build employee knowledge, skills, and capabilities, support achievement of overall objectives, and, contribute to high performance.	PPL1
	The company has a systematic induction process for new staff that includes familiarity with KM and its benefits, the KM system, and tools.	PPL2
	The company has formal mentoring, coaching, and tutoring processes.	PPL3
	The company has a database of staff competencies.	PPL4
	Knowledge sharing and collaboration are actively encouraged and rewarded / corrected.	PPL5
	Employees are organized into small teams/groups (i.e., quality circles, work improvement teams, cross-functional teams, Communities of Practices) to respond to workplace problems or concerns.	PPL6
Technology (TEC)	Management has established an IT Infrastructure (i.e., internet, intranet, and website) and has developed capabilities to facilitate effective KM.	TEC1
	The IT infrastructure is aligned with the company's KM strategy.	TEC2
	Everyone has access to a computer.	TEC3
	Everyone has access to the internet/intranet and an email address.	TEC4
	Information delivered in the website/intranet is updated on a regular basis.	TEC5
	Intranet (or similar network) is used as a major source of company-wide communication to support knowledge transfer or information sharing.	TEC6
Knowledge Process (KMP)	The company has systematic processes for identifying, creating, storing, sharing, and applying knowledge	KMP1
	The company maintains a knowledge inventory that identifies and locate knowledge assets or resources throughout the organization.	KMP2
	Knowledge accrued from completed tasks or projects are documented and shared.	KMP3
	Critical knowledge from employees leaving the company is retained.	KMP4
	The company shares best practices and lessons learned across the organization so that there is no constant re-inventing of the wheel and work duplications.	KMP5
	Benchmarking activities are conducted inside and outside the company, the results of which are used to improve organizational performance and create new knowledge.	KMP6
Learning & Innovation	The company articulates and continually reinforces the values of learning and innovation.	LNI1

(LNI)	The company regards risk taking or committing mistakes as learning opportunities, so long as they are not performed repeatedly.	LNI2
	Cross-functional teams are organized to tackle problems/concerns that cut across the different units in the company.	LNI3
	People feel empowered and that their ideas and contributions are generally valued by the company.	LNI4
	Management is willing to try new tools and methods.	LNI5
	Individuals are given incentives to work together and share information.	LNI6
KM Outcomes (KMO)	The company has a history (and maintains measures) of successfully implementing knowledge management and other change initiatives.	KMO1
	Measures are in place for assessing the impact of knowledge contributions and initiatives.	KMO2
	The company has achieved higher productivity through reduced cycle time, bigger cost savings, enhanced effectiveness, more efficient use of resources (including knowledge), improved decision-making, and increased speed of innovation.	KMO3
	The company has increased its profitability as a result of productivity, quality, and consumer satisfaction improvements.	KMO4
	The company has improved the quality of its products and/or services as a result of applying knowledge to improve business processes or customer relationships.	KMO5
	The company has sustained growth as a result of higher productivity, increased profitability, and better-quality product and services.	KMO6

III.2.2 Qualitative Approach: Semi-Structured Interview

After data from quantitative approach is successfully analysed and the outcome would be a maturity level of knowledge management in sub-directorate XY, researcher will conduct a semi-structured interview with Vice President in sub-directorate XY to share the result of quantitative data analysis and ask their opinion openly to collect more information further and the strategy about the implementation. Beside interviewing the senior leaders in sub-directorate XY, researcher will also conduct the semi-structured interview with the subject matter expert (SME) in automation of internal process and interview him about the knowledge management process in directorate IT. This qualitative research will enrich this research and provide more insight into how the knowledge management implementation in sub-directorate XY and in directorate IT will be developed further. The result of qualitative approach also will answer the reason or the why behind the respondent score and the prioritization of the implementation that cannot be answered from closed-ended questions via quantitative approach.

IV. RESULT AND DISCUSSION

IV.1 Analysis

A comprehensive and structured analysis is needed to give the best solution that matches the sub-directorate XY business issues. In this research, the researcher analyses the data based on quantitative data via survey questionnaire and qualitative data from the interview process already conducted in the previous chapter. The analysis process itself started with validity and reliability test result to ensure the collected data was valid and reliable, after that, researcher continued the process into respondent analysis and KM maturity level assessment analysis through each category in APO framework.

IV.1.1 Validity Test Result

A validity test is conducted to verify the data collection process through a quantitative approach via questionnaire is valid. The below validity test uses using SPSS tool, two-tailed Pearson correlation coefficient method for each question and compared to the r table with df = 56 (N-2) and 5% significance. The validity test using SPSS tool and the result is all questions under each category are having value bigger than critical value which indicating that the questionnaire is valid.

IV.1.2 Reliability Test Result

A reliability test is conducted to verify the data collection process through a quantitative approach via questionnaire is reliable. Below reliability test is using SPSS tool to find out the Cronbach's Alpha value for all categories with the below result:

Table IV. 1 Questionnaire reliability test result

Reliability Test Using Cronbach Alpha				
No	**Category**	**Cronbach Alpha Value**	**N of Items**	**Reliability**
1	Leadership	0.843	6	Good
2	Process	0.747	6	Be Accepted
3	People	0.869	6	Good
4	Technology	0.761	6	Be Accepted
5	Knowledge Process	0.933	6	Very Good
6	Learning & Innovation	0.826	6	Good
7	KM Outcomes	0.843	6	Good

Based on the above reliability test result, all category is had different ranges of Cronbach alpha values, and most of them are above 0,7 indicating, that the reliability of this questionnaire is acceptable and good.

IV.1.3 Respondent Analysis

The survey was given to employees of Telkomsel under sub-directorate XY. Respondents filled the survey through online forms using Microsoft Forms with participation level 96,67% with 58 respondents out of 60 respondents as total employees under sub-directorate XY. Based on Slovin's formula, to obtain a 95% confidence level with a 5% margin of error with a population size of 60 employees, the sample size required is 52 respondents hence this survey population can be categorized acceptable survey. The respondents are grouped into several categories shown below figure:

Figure IV. 1 Age distribution of employees in sub-directorate XY

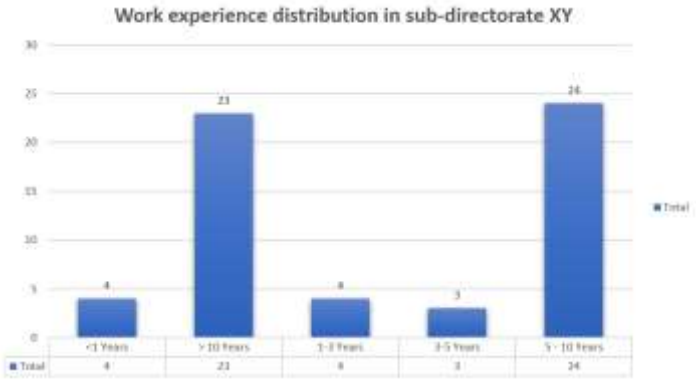

Figure IV. 2 Respondent's work experience distribution in sub-directorate XY

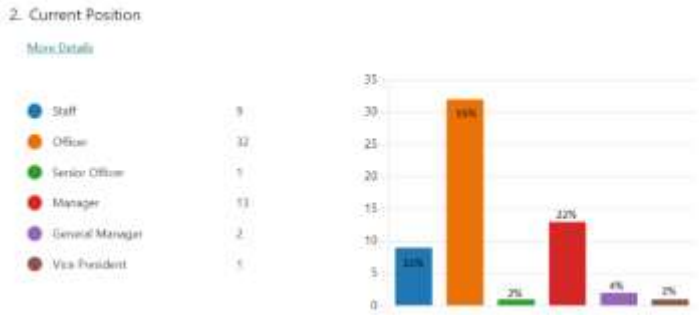

Figure IV. 3 Respondent's current job position distribution in sub-directorate XY

Most of the respondents were employees aged 30 – 35 years old (41%) followed by employees aged > 40 years old (22%) and the next are employees with aged range 25 – 30 years old (17%) and the next are employees with aged 35 – 40 years old (10%) and the last for employees with aged < 25 years old is on 9% of the total population.

The working period of the respondents is dominated by 2 groups of age distribution, 5 – 10 years working period with 24 employees from 58 respondents (41%) of the total population and followed dominated by above ten years working period with 23 employees from 58 respondents (40%) of the total population. The other population is divided into small populations distributed into less than one year working period and 1 – 3 years working period with four employees from 58 respondents (each 7%) of the total population. The last one is with the working period of around 3 – 5 years with three employees from 58 respondents (5 %) of the total population.

The respondent current job position is dominated by officer position with 32 employees from 58 respondents (55%) of the total population, followed by manager position with 13 employees from 58 respondents (22%) of the total population, staff position with nine employees from 58 respondents (15%,) of the total population, general manager position with two employees from 58 respondents (4%), senior officer and vice president job position with each one employee from 58 respondents (2%) of the total population.

IV.1.4 Knowledge management maturity level in sub-directorate XY

From the survey result, sub-directorate XY has a score 157,03 out of the maximum 210, with a gap to the maximum is around 52,97. This number represents that sub-directorate XY is still on the refinement level. Refinement level means knowledge management in the sub-directorate XY is continuously evaluated and improved. This is a good start for sub-directorate XY, but if we see clearly, the score is still far away to hit the mature level, hence there are some improvements that sub-directorate XY should adjust.

Table IV. 2 KM Maturity score of sub-directorate XY

No	Category	Max Score	Category Score	Score Gap
1	KM Leadership	30	21,74	8,26
2	Process	30	23,88	6,12
3	People	30	20,67	9,33
4	Technology	30	25,60	4,40
5	Knowledge Processes	30	19,86	10,14
6	Learning & Innovation	30	22,71	7,29
7	KM Outcomes	30	22,57	7,43
	Total	**210**	**157,03**	**52,97**

Figure IV.4 Radar chart of APO KM Maturity level in sub-directorate XY

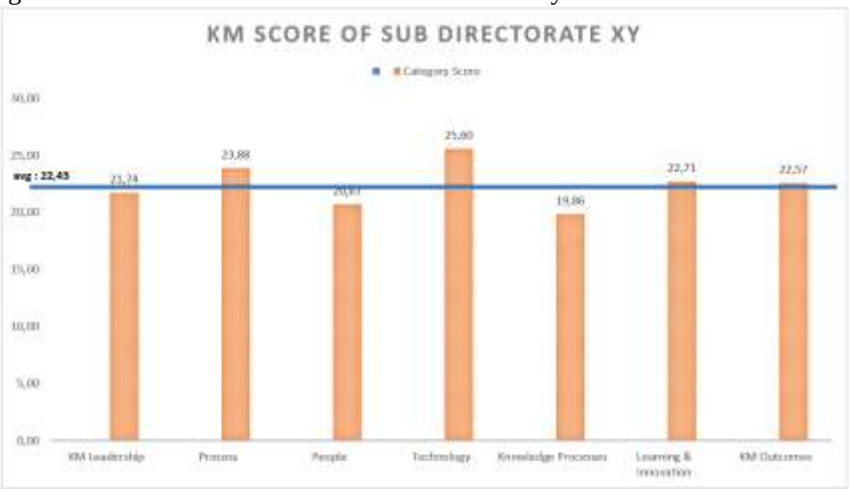

Figure IV.5 Column chart of APO KM Maturity level by category in sub-directorate XY

Based on the above column chart, the average value from all categories is 22,43, with the highest category in technology with a score 25,60. Another category above average is the process category with 23,88 score, the learning and innovation category, with a 22,71 score, and KM outcomes category with score 22,57. Entering the below average score category, in leadership category, the score is 21,74, for people category the score is 20,67 and the lowest score is on knowledge process category with score 19,86.

IV.1.5 KM Leadership category score and analysis

KM Leadership in sub-directorate XY is the third lowest score from all categories based on survey results with a score 21,74 out of 30 as a max score. If we go through each question under KM leadership category, we will see that questions LDR2 and LDR3 are under average among all questions. Starting with the lowest average score in (LDR3), respondents or employees in sub-directorate XY feel the financial resources or budget is allocated adequately for knowledge management initiatives with an average score of 3,02. The second lowest average score is LDR2 question related sub-directorate XY is organized to accommodate knowledge management activities. The result score is 3,25 indicating this process is already done inadequately.

Following up for the next question, LDR4 question related to how Telkomsel has a policy for safeguarding knowledge have an average score of 3,41. LDR6 question about management promotes, recognizes, and rewards sharing of knowledge and innovation process. LDR5 questions about managers becoming the role-model in the values of knowledge sharing, and collaborative working have an average score of 3,51. Question LDR1 with the highest average score in KM leadership category, the question about Telkomsel has knowledge management (KM) strategy linked to the company vision and mission and respondent give average score with 3,55. The average scores in all questions under KM leadership categories range from 3 up to 4 means that KM Leadership category in sub-directorate XY is between doing adequately and doing well and to make it more mature, several improvements and adjustments are needed.

Figure IV. 6 Survey result chart on KM Leadership category

IV.1.6 Process category score and analysis

Process category in sub-directorate XY is the second highest total score from all categories based on survey results with a score of 23,88 out of 30 as a max total score with an average of 3,69 ranging from question PRO1 until PRO6. If we go through each question under process category, we will see for question PRO1, PRO3 and PRO4 are under average among all questions. Starting with the lowest below-average score in PRO3 question, new technology, knowledge shared in the company, flexibility, efficiency, and effectiveness are factored into the design of processes with an average score of 3,55. The second lowest below-average score is PRO4 question related to the company has organized system for managing crisis situations or unforeseen events that ensures uninterrupted operations, prevention, and recovery and the result score is 3,25. The third lowest below average score is PRO1 question related to the company determining its core competencies (strategically important capabilities that provide competitive advantage) and aligning them to its mission and strategic goals, and the result score is 3,64.

Following up for the next question, PRO5 question related to the company implementing and managing its key work processes to ensure that customer requirements are met. Business results are sustained and the average score is 3,69. PRO2 question about the company designs its work systems and procedure to create value for customers, achieve performance excellence and have an average score of 3,74. Last but not least, Question PRO6 with the highest average score in the process category, the question about whether the company continually evaluates and improves its work processes to achieve better performance, to reduce variations, to improve products and services, and to be updated with the latest in business trends, developments, and directions and the result score is 3,90. These average scores in all questions under process category range from 3 up to 4 means that process category in sub-directorate XY is between doing adequately and doing well.

Figure IV. 7 Survey result chart on Process category

IV.1.6 People category score and analysis

The people category in sub-directorate XY is the second lowest total score from all categories based on survey results with a score of 20,67 out of 30 as a max total score with an average of 3,45 ranging from question PPL1 to PPL6. If we go through each question under the people category, we will see that questions PPL2, PPL3, and PPL4 are under average among all questions. Starting with the lowest below-average score in the PPL2 question, the company has a systematic induction process for new staff, including familiarity with KM and its benefits, the KM system, and tools, with an average score of 2,92. The second lowest below-average score is the PPL3 question. The company has formal mentoring, coaching, and tutoring processes, and the result

score is 3,21. The third lowest below-average score is the PPL4 question related to the company having a database of staff competencies, and the result score is 3,14.

Following up on the next question, the PPL1 question related to the company's education, training, and career development program building employee knowledge, skills, and capabilities, supporting the achievement of overall objectives, and contributing to high performance, and the average score is 3,32. PPL5 questions about knowledge sharing and collaboration are actively encouraged and rewarded/corrected and have an average score of 3,32. Last but not least, Question PPL6 with the highest average score in the people category, the question about employees is organized into small teams/groups (i.e., quality circles, work improvement teams, cross-functional teams, Communities of Practices) to respond to workplace problems or concerns and the result score is 3,34. These average scores in all questions under the people category range from 3 up to 4. This means that the process category in sub-directorate XY is between doing adequately and doing well, but several categories need improvement.

Figure IV. 8 Survey result chart on People category

IV.1.7 Technology category score and analysis

The technology category in the sub-directorate XY is the highest total score from all categories based on survey results, with a score of 25,60 out of 30 as a max total score with an average score of 4,27 ranging from question TEC1 to TEC6. If we go through each question in the technology category, we can see that questions TEC1, TEC2, TEC5, and TEC6 are under average among all questions. Started with the lowest below-average score for the TEC2 question; the IT infrastructure is aligned with the company's KM strategy, and the result score is 3,56. The second lowest below-average score is the TEC1 question; management has established an IT Infrastructure (i.e., internet, intranet, and website) and has developed capabilities to facilitate effective KM, and the result score is 3,62. The third lowest below-average score is TEC5 question-related. Information delivered on the website/intranet is updated on a regular basis, and the result score is 3,14. The last below-average score is for the TEC6 question, Intranet (or similar network) is used as a major source of company-wide communication to support knowledge transfer or information sharing, and the result score is 3,97.

The next analysis is for questions that have scored above average among all questions in the Technology category. TEC4 questions about everyone having access to the internet/intranet and an email address, and the average score is 4,44. The TEC3 question about everyone having access to a computer has the biggest average score among all questions under the technology category, with an average score of 4,5. All average scores in all questions under the technology category range from 3,5 up to 4,5 means that the technology category in sub-directorate XY is between doing adequately and doing well.

Figure IV. 9 Survey result chart on Technology category

IV.1.8 Knowledge Processes category score and analysis

The knowledge processes category in sub-directorate XY is the lowest total score from all categories based on survey results with a score of 19,86 out of 30 as a max total score with an average score of 3,31 ranging from question KMP1 to KMP6. This category is the only category with an average score below 20

compared to scores in all categories. If we go through each question in the knowledge processes category, we can see 4 out of 6 questions that are below average. There are KMP1, KMP2, KMP3, and KMP4. Starting with the lowest below-average score for the KMP4 question, Critical knowledge from employees leaving the company is retained, and the result score is 2,97. So far, this is the lowest score from all questions in all categories. The second lowest below-average score is the KMP2 question. The company maintains a knowledge inventory that identifies and locates knowledge assets or resources throughout the organization, and the result score is 3,06. The third lowest below-average score is the KMP5 question related to the company sharing best practices and lessons learned across the organization so that there is no constant re-inventing of the wheel and work duplications, and the result score is 3,07. The last below-average score is for the KMP3 question; knowledge accrued from completed tasks or projects is documented and shared; the result score is 3,09.

The following analysis is for the questions that have scored above average among all questions in the knowledge processes category. For example, the KMP1 question about the company has systematic processes for identifying, creating, storing, sharing, and applying knowledge, and the average score is 3,2. The KMP6 question about Benchmarking activities are conducted inside and outside the company, the results of which are used to improve organizational performance and create new knowledge, have an average score of 3,32. All average scores in all questions under the knowledge processes category range from 2,97 up to 3,32 means that the knowledge processes category in sub-directorate XY is between doing poorly and doing adequately.

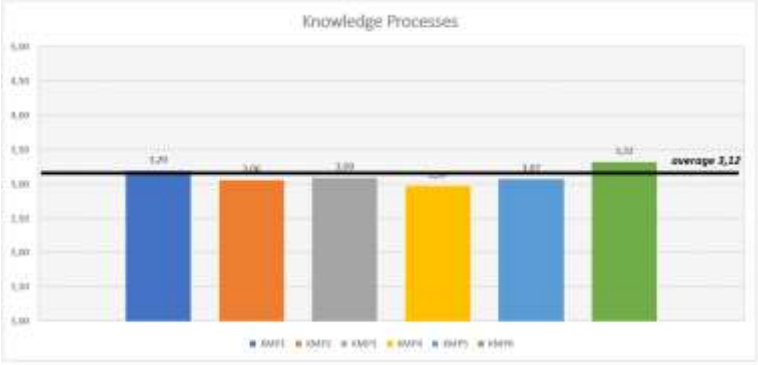

Figure IV. 10 Survey result chart on Knowledge Processes category

IV.1.8 Learning & Innovation category score and analysis

The learning & innovation category in the sub-directorate XY is the third highest total score from all categories based on survey results, with a score of 22,71 out of 30 as a max total score with an average score of 3,78 ranging from question LNI2 until LNI6. If we go through each question in the learning & innovation category, there are 2 out of 6 questions below average among all questions; there are LNI2 and LNI6 questions. Started with the lowest below-average score in the learning & innovation category; for the LNI6 question, individuals are given incentives to work together and share information, and the result score is 3,13. The second lowest below-average score is the LNI2 question; the company regards risk-taking or committing mistakes as learning opportunities, so long as they are performed sparingly, and the result score is 3,5.

The following analysis is for questions that have scored above average among all questions in the learning & innovation category. There are LNI1, LNI3, LNI4, and LNI5. For example, the LNI1 question about the company articulates and continually reinforces the values of learning and innovation, and the average score is 3,58. The LNI5 question has the same score as the LNI1 question; the question is about whether management is willing to try new tools and methods, and the score is 3,58. LNI3 question is about cross-functional teams that are organized to tackle problems/concerns that cut across the different units in the company and have an average score of 3,65. Lastly, with the highest score in the learning & innovation category, question LNI4 asking about people feeling empowered and that their ideas and contributions are generally valued by the company, has an average score of 3,83. All average scores in all questions under the learning & innovation category range from 3,13 up to 3,83 means that the learning & innovation category in the sub-directorate XY is doing adequately.

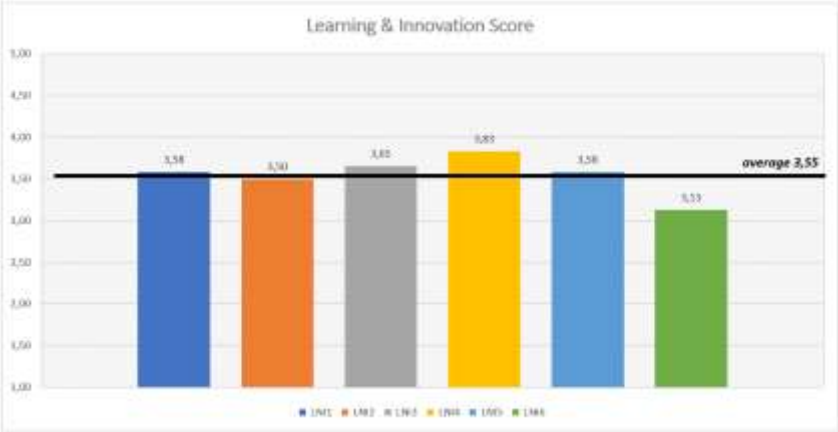

Figure IV. 11 Survey result chart on Learning & Innovation category

IV.1.9 KM Outcomes score and analysis

KM outcomes category in sub-directorate XY is the fourth highest total score from all categories based on survey results with a score of 22,57 out of 30 as a max total score with an average score of 3,76 ranging from question KMO1 to KMO6. If we go through each question in the KM outcomes category, there are 3 out of 6 questions below average among all questions; there are KMO1, KMO2, and KMO3 questions. Started with the lowest below-average score in the KM outcomes category; for the KMO2 question, measures are in place for assessing the impact of knowledge contributions and initiatives, and the result score is 3,28. The second lowest below-average score is the KMO1 question; the company has a history (and maintains measures) of successfully implementing knowledge management and other change initiatives, and the result score is 3,35. In the KMO3 question, as the third below-average score question, the question is how the company has achieved higher productivity through reduced cycle time, more significant cost savings, enhanced effectiveness, more efficient use of resources (including knowledge), improved decision-making, increased speed of innovation and the score result is 3,37.

The subsequent analysis is for the questions that have scored above average among all questions in the KM outcomes category. There are KMO4, KMO5, and KMO6 questions. KMO5 question is about whether the company has improved the quality of its products and services due to applying knowledge to improve business processes or customer relationships, and the average score is 3,67. The KMO4 question is about whether the company has increased its profitability due to productivity, quality, and consumer satisfaction improvements, and the score is 3,71. Lastly, with the highest score in the KM outcomes category, question KMO6 asks whether the company has sustained growth due to higher productivity, increased profitability, and better-quality product and services, having an average score of 3,74. All average scores in all questions under the KM outcomes category range from 3,28 up to 3,74 means that the KM outcomes category in sub-directorate XY is doing adequately.

Figure IV. 12 Survey result chart on KM Outcomes category

IV.1.9 Knowledge Management Maturity Level in sub-directorate XY (Qualitative Analysis) – Semi-Structured Interview

The first interview with the Vice President of sub-directorate XY was conducted on 12 April 2023, 10 AM, in the meeting room at Telkomsel Smart office, 16th floor. The interview lasted around 45 minutes. In the early interview activity, the researcher briefly explained the APO framework and the survey result and, along the way, interviewed him per category.

The second interview was conducted on the same day and in the same room, at 4 PM, and lasted around 40 minutes, with General Manager in IT Directorate. The interview sequence is the same as the first interview, like introducing the APO Framework in the beginning, sharing the survey result, and continuing to the interview session.

The analysis of this interview activity shows that both interviewees had similar sentiment responses to the KM Maturity level in sub-directorate XY. The negative sentiment that later can be as an opportunity to sub-directorate XY and directorate IT is in the category KM Leadership, People, KM Processes, Learning and Innovation, and KM outcomes.

IV.1.10 Data Triangulation

Quantitative and qualitative results will be analysed further using data triangulation analysis. Data Triangulation analysis will determine the relationship between quantitative and qualitative analysis results which are categorized as convergence (the result is identical), complementary (the result completes each other), and divergent (the result is contradictive of each other). The triangulation result shows that quantitative and qualitative data have a convergent and complementary relationship.

IV.2 Business Solution

Based on Quantitative, Qualitative, and data Triangulation analysis, researcher found several opportunities that can be improved to overcome the weaknesses and increase the KM maturity level in sub-directorate XY. The summary of the business solution is shown in the below table.

Table IV. 3 Business solution in sub-directorate XY

No	List of Solution	Area	Category	Goals
1	Create single knowledge repositories in Sub-directorate XY	KMP 2	KM Technology	To make a centralized knowledge asset easy to access, search, and store.
2	Create IT Knowledge Hub platform in sub-directorate XY	PRO3, PRO4, KMP2	KM Technology	This is the ultimate version of the single knowledge repositories. IT Knowledge hub would have features to analyse the sources of every document located in the knowledge repositories and to make it easier to search and have insight for specific use cases or question.
3	Set a workflow of knowledge management processes starting from the induction process, working in the unit, and for resigned employees in sub-directorate XY	PPL2, KMP4	KM Process	To retain the knowledge from each employee and make the knowledge a company's asset not an employee's asset. To accelerate the knowledge transfer process and minimize the business impact when key employees are transferred or resign.

No	List of Solution	Area	Category	Goals
4	Add employees of the month criteria with knowledge management activities, learning, and innovation submission participation rate	PPL1, LDR6, KMP1, LNI 1, LNI 6, KMO 2	KM Process	Motivate employees who contribute extra positively to the company outside their daily job responsibilities in KM activities, learning, and innovation.
5	Gamification of knowledge activity (identify, create, store, share, and apply), learning hours, and innovation program	PPL1, LDR6, KMP1, LNI 1, LNI 6, KMO 2	KM Process	To stimulate the KM activities more exciting and provide rewards and incentives to the employees who contribute positively.
6	Kick-off for knowledge unit team in sub-directorate XY	LDR 2	KM People	To prevent the same mistake in developing the KM system in the past, the KM unit is needed to make the KM activities up-to-date and continuously promoted and executed.
7	Regular biweekly sharing sessions on sub-directorate XY	PPL4, PPL5, KMP4	KM Process	To increase the KM activities culture in sub-directorate XY.
8	Set budget allocation to support KM activities like inviting external speakers.	LDR 3	KM Process	To support KM activities related to financial needs in sub-directorate XY, especially for benchmarking and knowledge sharing with external parties.
9	Set informal coaching and mentoring process to collaborate with other sub-directorate or outside the organization.	PPL3	KM People	To increase motivation, feedback culture, self-development, and career vision support sub-directorate XY's goals to be a learning and innovative organization.
10	Survey all sub-directorate XY employees about their technical skills, competencies, and capabilities	PPL4	KM Process	Sub-directorate will have skills, competencies, and capabilities that can be utilized and combined to build a community of practice or organizational purposes.

No	List of Solution	Area	Category	Goals
11	Set Biweekly Knowledge creation program success stories, lessons learned from projects, and incident documents.	KMP3, KMP5, KMO 6	KM Process	To make sub-directorate XY a knowledge-driven organization that will keep learning and be the learning organization that will learn from past activities to support any decision-making or solving any issue in the future.
12	Quarterly external speaker-sharing sessions as benchmark activities	KMP6	KM Process	To increase the KM awareness, learning, and innovation value from external.
13	Commitment from leaders to promote KM processes and stated in the Leader Action Plan from the Managerial level to VP Level	LDR5	KM People	To increase the awareness and engagement on implementing KM activities, learning, and innovation on sub-directorate XY employees, which is influenced by their leader as a role model (change management).
14	Find a ready-to-use Knowledge Management System (framework/platform) that meets sub-directorate XY or IT Directorate needs	LDR2, LDR3, TEC2	KM Technology	To choose the tools or framework for implementing the knowledge management system or IT knowledge hub.
15	Internal Innovation Competition in sub-directorate XY per semester	LNI1	KM Process	To increase the innovation rate in sub-directorate XY and allow high-performance employees who actively contribute to sub-directorate XY through learning, research, and innovation.
16	Weekly Sharing about everything related soft skills or technical or technology or anything that is related and valuable for sub-directorate XY	KMP5, KMP6	KM Process	To create sharing activities embedded in the sub-directorate XY weekly culture and to increase the employee's willingness to share with others.

V. CONCLUSION

Based on data collection analysis from quantitative and qualitative data, the current KM Maturity level in sub-directorate XY Telkomsel is at the refinement level with a score of 157,03 points out of 210 points for its

KM practice. This refinement level shows that KM implementation in sub-directorate XY is continuously evaluated and improved. Several KM categories need to be enhanced in the Knowledge Processes, People, and KM Leadership categories.

The proper knowledge management design for supporting digital talents and innovation in sub-directorate XY to support business transformation in Telkomsel is a combination of an influential culture that promotes and appreciates learning, KM activities, and innovation processes, strong leadership from leaders that **commit to promoting the implementation of knowledge management in sub-directorate XY, resource allocation to manage** the knowledge management in sub-directorate XY, supported by KM technologies and framework to accelerate the KM activities like KM creation, store, sharing and apply and last but not least, KM implementation in sub-directorate XY should continuously be evaluated, adjusted and improved align with the technology and business trends that embedded in Telkomsel strategic goals.

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