Maturity Assessment of Knowledge Management in the Transition of Organizational Transformation at PT Telkom Indonesia (Persero) Tbk

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ABSTRACT: The telecommunications industry is rapidly and significantly changing due to rising customer demands and digitization. Telecom businesses are exploring new strategies to maintain a competitive advantage. As the biggest telecommunication provider, PT Telkom Indonesia (Persero) Tbk (Telkom) consistently innovates and collaborates to foster a fair digital environment. This drive motivates Telkom to accelerate its transformation and lead Indonesia's digitalization efforts. During this transformation process, Telkom needs to assess its knowledge management (KM) maturity level. This study will explore Telkom's KM maturity, highlight gaps, and recommend business solutions. Using a mixed-methods approach, quantitative data were collected from surveys based on the Asian Productivity Organization (APO) framework, while qualitative data were gathered through in-depth interviews. This holistic approach ensures a comprehensive understanding of the key success factors of knowledge management. The research shows that the KM maturity level of Telkom is categorized as the 4th level or refinement level. This level indicates that Telkom's KM progress aligns with the organization's vision, mission, objectives, and priorities. However, there is still potential for continuous evaluation and improvement. Based on the data analysis, Telkom can implement several proposed business solutions, informed by 11 key success factors, to enhance the critical programs for organizational transformation.

KEYWORDS: Knowledge Management, KM maturity level, Organizational transformation, Telecommunication industry

I. INTRODUCTION

The telecommunications industry in Indonesia projected to grow consistently each year as more individuals enter the digital age. According to Badan Pusat Statistik, in the fourth quarter of 2023 this industry contributed IDR 883,68 trillion to the GDP, up by 7.74% over the same period the previous year. This suggests that the national economy is stimulated by the telecommunications industry.

The Indonesian telecom market is highly fragmented, with most of local businesses and a few international operators. The leading providers of telecommunications services in Indonesia are PT Telkom Indonesia (Persero) Tbk (Telkom), PT XL Axiata Tbk, and PT Indosat Tbk. A few telecom companies in Indonesia are significant players in the global telecom market and are competitive on the worldwide stage.

Telkom is the largest telecommunications provider in Indonesia and is dedicated to becoming a prominent digital telecom company, playing an active role in advancing Indonesia's digital independence and sovereignty. In its transition to a digital telecommunications company, Telkom has redefined its strategic objectives through the Five Bold Moves (5BM) initiative, which encompasses five transformation programs: Fixed Mobile Convergence (FMC), InfraCo, Data Center Co, B2B Digital IT Service Co, and DigiCo. The initial phase of this initiative resulted in the transfer of a small percentage of Telkom's employees to Telkomsel, necessitating adjustments to Telkom's organizational structure. This shift has impacted employee movements within the Telkom group, affecting various units, divisions, and subsidiaries. Strategic planning for these transfers is expected to be finalized by the end of 2025.

As the strategy continues to evolve, it is imperative for Telkom to rigorously assess these significant changes concerning their potential impacts and alignment with the company's long-term objectives. Therefore, it is crucial for Telkom to evaluate its knowledge management maturity level to enhance the internal implementation of knowledge management practices, particularly by improving the quality of its knowledge management system.

This research focuses on several key areas based on Telkom's condition to address the identified challenges by formulating them into the following Research Questions:

    a)   What is the current state of KM maturity level during the transition of organizational transformation in Telkom's operational office?

b) What are the key success factors of KM in order to support the organizational transformation?

c) What can Telkom do to improve its knowledge management practice in order to support the organizational transformation?

These key areas were integrated to improve the quality of knowledge management at Telkom, focusing on the following research objectives:

a) Measurement of knowledge management's maturity level during the transition of organizational transformation.

b) Identifying the Key success factors of KM in order to support the organizational transformation.

c) Providing recommendations for Telkom to increase knowledge management's implementation to face another initiative transformation moves.

II. LITERATURE REVIEW

A. Knowledge and SECI Model

According to Broadbent (1998), Cleveland (1982), Haeckel & Nolan (1993), and Streng (1999), knowledge in information theory is frequently depicted as a hierarchical ladder, with data at the base, information at the middle, knowledge at the top, and thus on. Based on this understanding, three categories can be used to group the different ways people learn to comprehend the world (Tjakraatmadja & Lantu, 2006):

a) Cultural knowledge is an individual's understanding of the world based on their standards, values, and beliefs.

b) Tacit knowledge is derived from personal experience and theoretical comprehension of the universe.

c) Explicit knowledge refers to comprehending the world through established systems, laws, norms, and operating procedures.

Nonaka and Takeuchi introduced the SECI Model, which has become a crucial framework for knowledge creation and transfer (Nonaka and Takeuchi, 1996). They propose that the fundamental idea of the SECI model is that tacit knowledge can be externalized and made explicit. This model is considered a foundational aspect of knowledge management, as it illustrates how knowledge creation can be a valuable tool for developing new ideas or concepts. The SECI model illustrates the interaction among four key knowledge processes: socialization, externalization, combination, and internalization. This framework enables the conversion of tacit knowledge into explicit knowledge and vice versa.
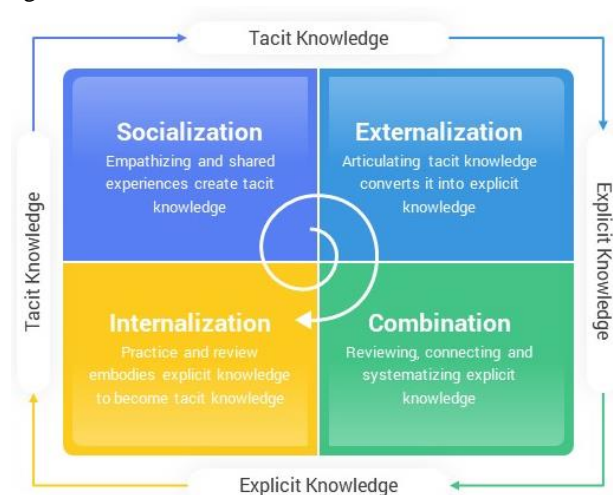
Figure 1. The SECI Model

B. Knowledge Management

Knowledge management is the process of identifying and leveraging an organization's collective knowledge in order to strengthen its competitive advantage (von Krogh, 1998). The KM framework comprises four essential components: People, Process, Technology, and Governance (Tjakraatmadja and Kristinawati, 2017).
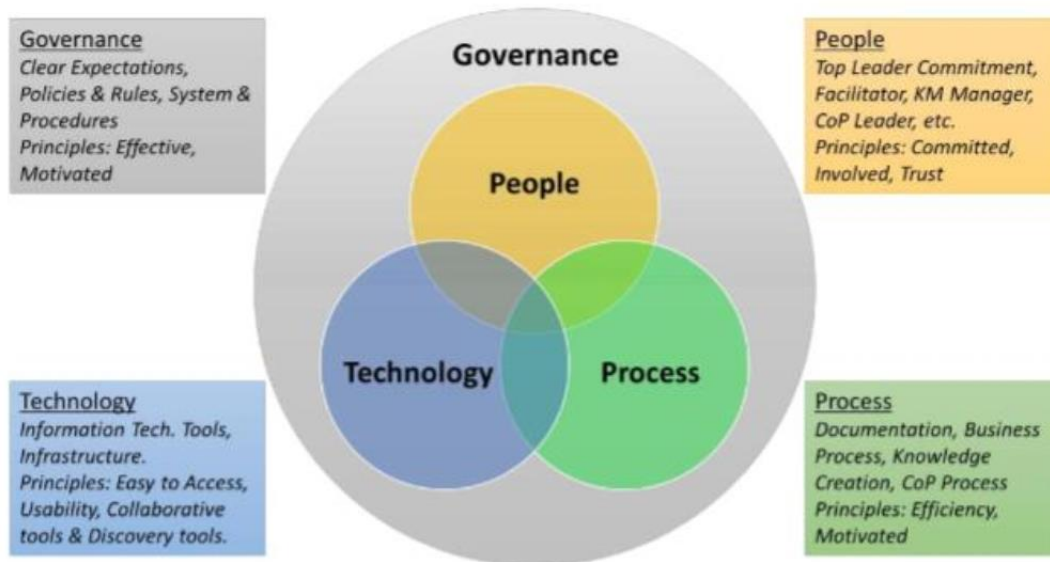
Figure 2. KM Framework

1) *People*

People are essential for knowledge management because they are the main producers, distributors, consumers, and keepers of knowledge inside a company. Through a comprehensive comprehension of the individual's role in the knowledge management process, businesses can devise efficacious methods for knowledge acquisition, preservation, and dissemination, hence promoting innovation and creating value.

2) *Process*

Processes enable to ensure uniformity, effectiveness, quality, and ongoing development inside the company by formalizing and systematizing knowledge management. An organization can use its knowledge assets to foster innovation, enhance decision-making, and create value by putting in place efficient knowledge management procedures.

3) *Technology*

Technology is essential to knowledge management because it provides the infrastructure and tools needed for organization. It makes knowledge easy to access for staff members, promotes teamwork, automates procedures, and maintains security and control by limiting access to sensitive data to authorized users only.

4) *Governance*

Governance factors contribute to the definition of policies, procedures, roles, and responsibilities required for effective knowledge management and alignment with corporate objectives. For managing the people, procedures, and technology involved in knowledge management, they offer a framework.

C. APO Knowledge Management Framework

The Asian Productivity Organization (APO) is an intergovernmental organization aimed at improving productivity in the Asia-Pacific region. One of its key frameworks, the APO Knowledge Management Framework, highlights the significance of knowledge management for achieving organizational success. This framework defines knowledge management as an integrated approach to creating, sharing, and applying knowledge, ultimately enhancing organizational productivity, profitability, and growth (Asian Productivity Organization, 2020).
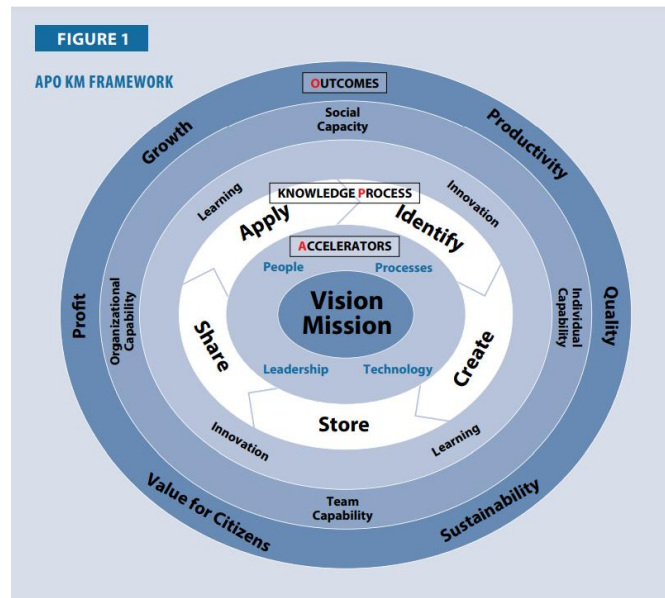
Figure 3. APO KM Framework

The APO Knowledge Management Assessment Tool is based on the APO Knowledge Management Framework. APO Knowledge Management Assessment Tool includes seven groups of criteria (Karami, 2015):

1) *Leadership*

This category evaluates the organization's leadership capability to address the challenges of a knowledge-based economy. The evaluation of knowledge management leadership is based on the organization's policies and strategies. Leadership is also assessed regarding initiatives to initiate, guide, and sustain knowledge management activities within the organization.

2) *Process*

This category assesses the application of knowledge in managing, executing, and enhancing the core work processes within the organization. It also examines how frequently the organization evaluates and improves its work procedures to enhance performance.

3) *People*

This category evaluates the organization's ability to foster and sustain a knowledge-driven learning culture. The assessment includes initiatives aimed at promoting collaboration and knowledge sharing, as well as the professional development of knowledge workers.

4) *Technology*

This category evaluates how well the organization develops and provides knowledge-based solutions, including content management systems and collaborative tools. These instruments accessibility and dependability are also assessed.

5) *Knowledge Process*

Knowledge process evaluates how well the organization can find, produce, store, distribute, and use knowledge in an organized way. Evaluation is also given to the exchange of best practices and lessons discovered in order to minimize reinventing the wheel and work duplications.

6) *Learning and Innovation*

This category assesses the ability of organization to promote, support, and enhance learning and innovation through systematic knowledge processes. Management's efforts to instil values of learning and innovation, as well as to provide incentives for knowledge sharing, are also evaluated.

7) *Knowledge Management Outcomes*
   This category evaluates how effectively the organization can develop new and improved services and products to deliver greater value to citizens and consumers. It assesses the organization's capacity to enhance output, quality, profitability, and sustainable growth by efficiently utilizing its resources and fostering innovation and learning.

Furthermore, the total score for all audit criteria is adjusted using the APO Knowledge Management Maturity Model to assess the organization's current Knowledge Management Maturity level. Within this framework, the APO classifies Knowledge Management maturity into five levels, beginning with the reaction level as the least mature and advancing to the maturity level, which signifies the highest degree of maturity (Asian Productivity Organization, 2020).
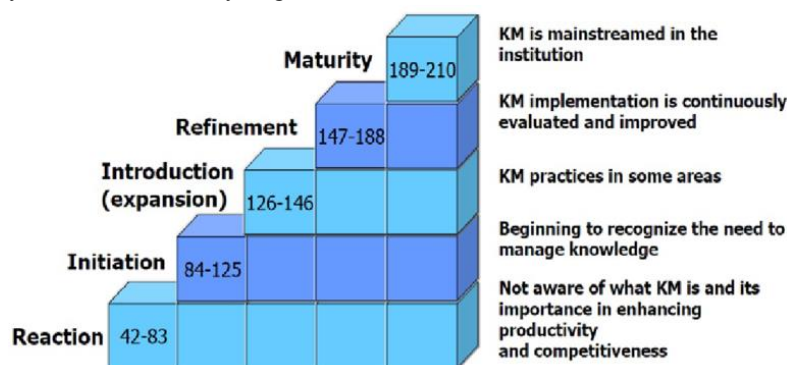

Figure 4. APO KM Maturity Level

1) *Level 1: Reaction Level*
   The organization does not understand knowledge management or how important it is to boost competitiveness and productivity.

2) *Level 2: Initiation Level*
   The organization may already be starting a prototype Knowledge Management project, or it may just be beginning to realize how important it is to manage knowledge.

3) *Level 3: Expansion Level*
   The knowledge management is fully implemented and deployed.

4) *Level 4: Control Level*
   The application of knowledge management is continually evaluated to make improvements.

5) *Level 5: Maturity Level*
   The organization has completely mainstreamed knowledge management.

III. METHODOLOGY

This research used a mixed methods approach which combines elements of quantitative and qualitative research to analyze Knowledge Management at Telkom. Quantitative research will employ surveys and questionnaire, whereas qualitative research will involve in-depth interviews with stakeholders and focus group discussions. The integration of both qualitative and quantitative data will offer a thorough understanding of the approach and results, enabling the drawing of more trustworthy conclusions.

A. *Quantitative Data*

The data collection for quantitative research is use an online survey. Surveys are a key method for collecting primary data by posing questions to individual respondents. The researcher chose APO as the KM Framework because the APO framework seems to be the most compact package and relevant to current situation also easier to understand by the respondent. To be eligible to answer this questionnaire, a respondent must fulfil some requirements, which is respondent is a permanent employee of Telkom, respondent is

employees of Unit/Division that impacted the transformation and respondent is employees of Telkom from officer to managerial level. In this research, the cross-sectional research sis used to calculate the minimal sample size with the number of total employees in one of Telkom operational office or the population size is 149. The result of sample size from Cross-sectional research is 46.74 (rounded up to 47), which means that the number of respondents used in this research must be more than 47 respondents. Validity and reliability tests are necessary to assess the data and provide a foundation for the proper interpretation of the quantitative data. Person's correlation is used in this study for validity testing, and Cronbach's alpha correlation is used for reliability testing.

B. Qualitative Data

The semi-structure interview question for gathering qualitative data is based on the quantitative outcome, and it compares with the current situation to identify any gaps that may exist. The respondents are the managerial level in Telkom. This strategy aims to increase comprehension of the quantitative results and provide conclusions to improve the KM maturity.

C. Data Analysis Method

Telkom's maturity score will be calculated by averaging all the scores for each question from the survey and then integrating all the averages to get the total maturity score and related category average. These results will assist the researcher find the KM gaps and identify areas in which the company needs to improve. The fishbone diagram is used in this research to analyze the research objective's root causes. The fundamental causes will be determined as the key success factor for Telkom's knowledge management. Moreover, APO KM maturity assessment category will be mapped into the KM framework and SECI model. This combination analysis of mapping and fishbone diagram will assist the organization in having the appropriate benchmark and parameters for improve knowledge management implementation.

IV. RESULTS

The assessment of knowledge management maturity in Telkom during the transition of organizational transformation using the APO KM Framework consists of 42 questions, which are categorized into seven categories. The survey was filled out by 64 employees, with the majority of respondents being over 40 years old and having worked for more than five years of experience. The survey has a value of Cronbach's Alpha higher than 0.7, showing the results of the research survey are consistent and reliable. Moreover, the value of the correlation coefficient from the survey is higher than the table's critical value of 0.244, which means the research survey is valid. The total score of Telkom assessment KM maturity is 170.34 with the highest average score on Technology (25.61), while the lowest is on Knowledge Process (23.30). According to the result, Telkom is categorized as the 4th level or Refinement level within the APO KM Framework. This level indicates that Telkom's KM Progress has aligned with the organization's vision, mission, objectives, and focus. However, there is a place for continuous evaluation and improvement.
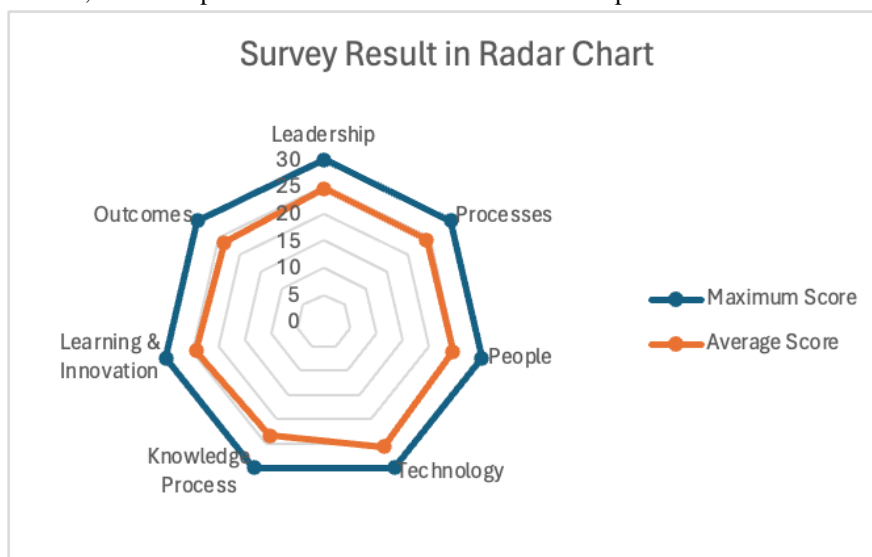

Figure 5. Telkom's Survey Result in Radar Chart

Table 1. Detail Score for Each Factor Assessment

Category	Maximum Score	Average Score	Gap
Leadership	30	24.72	5.28
Processes	30	24.36	5.64
People	30	24.52	5.48
Technology	30	25.61	4.39
Knowledge Process	30	23.30	6.70
Learning & Innovation	30	24.23	5.77
Outcomes	30	23.61	6.39
Total	210	170.34	39.66

The key success factor for KM improvement will be selected based on the quantitative results that show a below-average score per category. Table below shows the list of key success factors that having lower score compared to average of these questions. In Combination with the interview result, there will be several points to be adjusted as part of review.
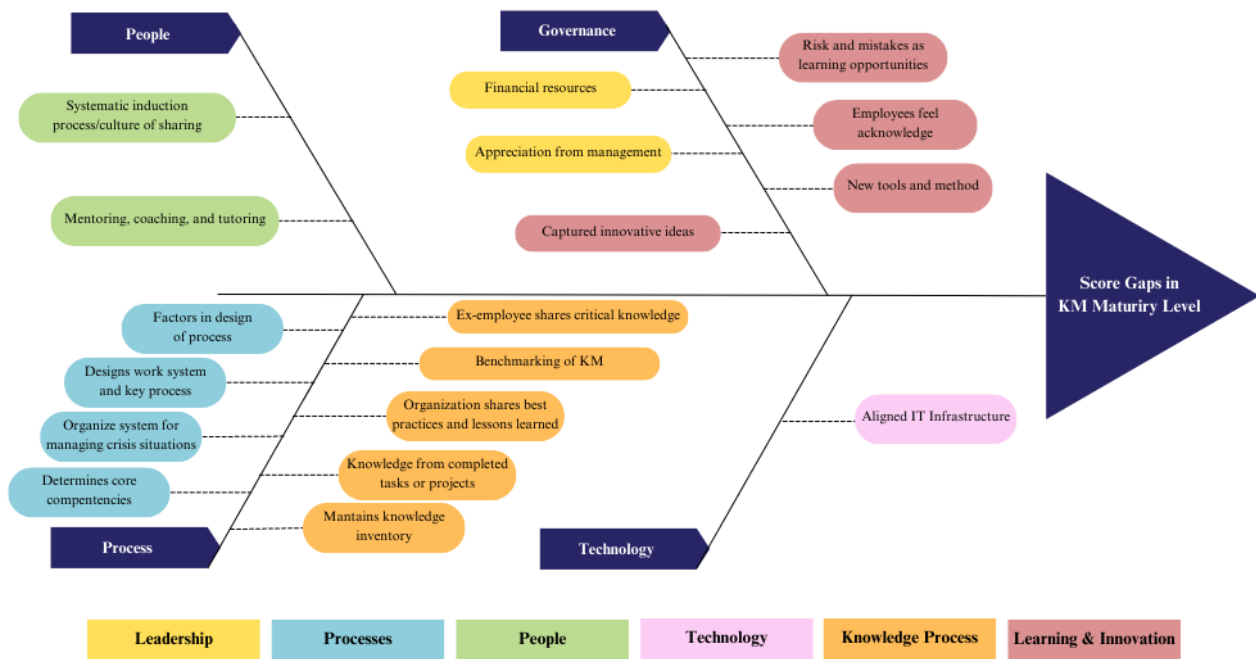

Figure 6. Key Success Factors on Fishbone Diagrams

Table 2. Key Success Factors

No.	KM Maturity Assessment Category	Key Success Factor	Question No.	Average Score	KM Framework
1	People	Systematic induction process/culture of sharing	14	4.05	People
2	People	Mentoring. coaching. and tutoring	15	4.02	People
3	Leadership	Financial resources	3	4.02	Governance
4	Leadership	Appreciation from management	6	3.95	Governance

5	Learning and Innovation	Risk and mistakes as learning opportunities	32	4.03	Governance
6	Learning and Innovation	Employees feel acknowledge	34	3.91	Governance
7	Learning and Innovation	New tools and method	35	3.94	Governance
8	Learning and Innovation	Captured innovative ideas	36	4.03	Governance
9	Outcomes	Historical of implementing KM	37	3.86	Governance
10	Outcomes	Measurement for assessing KM	38	3.95	Governance
11	Outcomes	Effectiveness in doing KM - Productivity	39	3.88	Governance
12	Outcomes	Effectiveness in doing KM - Profitability	40	3.95	Governance
13	Outcomes	Effectiveness in doing KM – Product/services	41	4.02	Governance
14	Outcomes	Utilizing existing knowledge assets	42	3.95	Governance
15	Process	Determines core competencies	7	4.05	Process
16	Process	Designs work system and key process	8	4.02	Process
17	Process	Factors in design of process	9	3.94	Process
18	Process	Organize system for managing crisis situations	10	4.02	Process
19	Technology	Aligned IT Infrastructure	20	3.94	Technology
20	Knowledge Process	Systematic process	25	4.05	Process
21	Knowledge Process	Maintains knowledge inventory	26	4.03	Process
22	Knowledge Process	Knowledge from completed tasks or projects	27	3.84	Process
23	Knowledge Process	Ex-employee shares critical knowledge	28	3.69	Process
24	Knowledge Process	Organization shares best practices and lessons learned	29	3.77	Process
25	Knowledge Process	Benchmarking of KM	30	3.92	Process

V. CONCLUSIONS

Based on the research results, the maturity level of Telkom's operational office is refinement or control level. At this level, certain areas of the organization have standardized knowledge management practices. However, there is still a lack of continuous evaluation for continuous improvement to reach the desired maturity level, especially for the items that have below-average scores. There are several initiatives that can be implemented by Telkom that will enhance knowledge management's contribution to the company's vision and long-term competitive advantages while it undergoes organizational transformation. These initiatives are defined by grouping the relevant priority of key success factors to KM framework.

Table 3. Proposed Solution based on Key Success Factors

KM Framework	*Initiatives*
overnance	The proposed solution in the governance components to support the organizational transformation: a) KM roadmap & implementation planning to be conducted to achieve its goals and measurements for the evaluation & continuous improvement. b) Alignment of the understanding direction & business objective regarding Organizational Transformation to the importance of knowledge management implementation. c) Formal policy regarding acknowledged and appreciated for employee's contributions by management in the organization.

Technology	The proposed solution in the technology components is provided below: a) Ensure the information provided in the Company's KM tool is updated and aware by the employees. b) Ensure the information available is being updated and relevant to support the specific business issue (e.g. Coaching & mentoring Tools).
People	The proposed solutions in the people component are explained below: a) Creating a strategic approach that combines leadership commitment, education, communication, incentives, and the integration of KM into daily activities, organizations can enhance employee awareness and foster a culture of knowledge sharing. b) Maintain the continuity of employee development program by alignment to current skill that organization needs. c) Assignment to "Culture Agent & Culture Booster" as a knowledge leader for maintaining the knowledge management implementation and culture of sharing, mentoring & coaching between the employees within the organization.
Process	The proposed solutions in the process component are explained below: a) Creating a regenerating system involves setting up an unceasing mechanism for accumulating and renewing knowledge. b) Socialization for knowledge storing to company's drive or KM tools (e.g "Kampiun") to ensure the knowledge can be used for future knowledge. c) Increasing Employee's awareness and capability to capture valuable knowledge from retired/transferred employees.

VI. PROPOSED IMPLEMENTATION PLAN

Activities	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Developing KM Strategies										
KM Roadmap	■	■	■	■	■					
Implementation Planning					■	■				
Strengthening Knowledge-based environment										
IT Infrastructure Improvement						■	■	■		
Awareness of KM's importance			■	■	■	■				
Employee Development							■	■	■	
Improving the culture of knowledge storing and sharing										
Knowledge leader								■	■	
Program culture								■	■	
Evaluation										
Employee satisfaction survey										■

REFERENCES

1. Alavi, M., & Leidner, D. E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. MIS Quarterly, 25(1), 107.
2. APO. (2020). Knowledge Management Tools and Techniques Manual. Tokyo: Asian Productivity Organization.
3. APQC (Asia Pacific Quality Organization). (2020). Knowledge Management Capability Assessment Tool.
4. Association for Southeast Asian Nations (ASEAN). (2021). ASEAN Digital Masterplan. Jakarta.
5. Broadbent, M. (1998). The Phenomenon of Knowledge Management: What Does it Mean to the Information Profession? Information outlook, 23-36.
6. Cleveland H. (1982). Information as Resource. The Futurist, 34-39.
7. Haeckel and Nolan. (1993). Knowledge Management and Dynamic Nature of Knowledge, Journal of American Society for Information.
8. Karami, M., Alvani, S.M., Zare, H.R., & Kheirandish, M. (2015). Determination of Critical Success Factors for Knowledge Management Implementation, Using Qualitative and Quantitative Tools (Case study: Bahman Automobile Industry). Iranian Journal of Management Studies, 8, 181-201.
9. Krussel, P. (2019). Future Telco: Successful Positioning of Network Operators in the Digital Age.
10. McElroy, Mark W. (2010). The new knowledge management: complexity, learning and sustainable innovation.
11. McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. Journal of the American Society for Information Science and Technology, 53(12), 1009–1018.
12. Nonaka, I. and Takeuchi, H. (1995). The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford University Press.
13. Tjakraatmadja, J. H. (2021). KM Driven Enterprise. Class Materials (Unpublished Document). School of Business and Management-ITB.
14. Tjakraatmadja, Jann & Kristinawati, Didin. (2017). Strategi Implementasi Knowledge Management.
15. Von Krogh, G. (1998). Care in Knowledge Creation. California Management Review, 40(3), 133-153.
16. Wiig, K. M. (1997). Knowledge Management: An Introduction and Perspective. Journal of Knowledge Management, 1(1), 6–14.
17. World Bank. (2019). The Digital Economy in Southeast Asia: Strengthening the Foundations for Future Growth, Washington, DC.
18. Yang, A.T.H. (2023). 'ASEAN's Splintering Digital Economy Governance'. East Asia Forum.