

# Knowledge Management Readiness Level Analysis Using Asian Productivity Organization (APO) Framework Approach in PT TPPI

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**ABSTRACT :** *The petrochemical industry is one of the main drivers of national economic development. PT TPPI was established in 1995 and produces industrial products. Two business development projects are being run: The Revamping Aromatic Project and The New Olefin Project. The Continuous Improvement Program (CIP) allows TPPI to expand and innovate, but the number of teams or employees engaged in CIP activities is continuing to decline. The researcher conducted research on the knowledge management readiness level at TPPI using mix analysis methods. The quantitative study is done using KM readiness level measurement by the APO framework and prioritization sequence findings by the AHP Method. The qualitative study is done using semi-structured interviews to find business solutions for the two lowest category scores. The overall study was analyzed by the combination of KM readiness level measurement, OFIs, and KM methods and tools based on the APO framework. The KM readiness level was spot on at 131, and the prioritization sequence analysis was achieved with the two lowest category scores known to be "Learning & Innovation" and "People". Qualitative analysis was used to develop 7 business solutions and 15 implementation plans, which are scheduled to take place from August 2023 to December 2024.*

**KEYWORDS** - AHP Method, APO Framework, KM Readiness Level, Petrochemical, Semi-structured interview

## I. INTRODUCTION

PT TPPI was established on November 21, 1995. TPPI produces industrial products, which include petroleum refining, the chemical industry, chemical goods, and other specialized wholesale trade. The main products are aromatics, particularly paraxylene, benzene, orthoxylene, heavy aromatics, and toluene. The Revamping Aromatic Project and the New Olefin Project are two business development projects being run in PT. TPPI. The Revamping Aromatic Project will increase petrochemical production from 600 thousand tons to 780 thousand tons per year, while the New Olefin Project will create foreign exchange savings of up to 4.9 billion US dollars. The success of these projects is critical as they will help to energy security by substituting imported petrochemical products and growing other labour-intensive sectors. Greater effort must be made to ensure the project's success.

It is important to review TPPI's ongoing and future development to maximize value and gain a sustainable competitive advantage. Improvement activities of enterprises should be considered in the light of their competitive environment and the strategies they adopt as their competitive advantage (Alavi & Leidner, 2001). At TPPI The Continuous Improvement Program (CIP) was launched in 2021 to improve and build a program through evaluation activities. However, the number of teams or employees engaged in CIP activities is continuing to decline. Schenk, et al. (2016) said that clearly there is a positive relationship exists between knowledge management, innovation and the performance of firms. If the improvement of understanding of how knowledge management techniques, practices, and processes improve the performance of innovative firms is necessary, then it is necessary to go beyond econometrics.

The researcher recognizes the importance of knowledge management (KM) application in TPPI, but there is no department or regulatory body that explicitly organized KM. However, TPPI has adopted KM principles, such as the implementation of CIP. This study aims primarily to; measure of KM's readiness level in TPPI; recognize gaps of KM's readiness level in TPPI; develop implementation plans in TPPI to increase KM readiness level. Additionally, the research also aims to build a culture in which knowledge is viewed as valuable and strategic resources to facilitate and ensure the long-term viability of the TPPI business and development.

## II. LITERATURE REVIEW

Several ways for implementing KM models are provided, including comprehensive and tiered approaches. Heisig (2009) undertook a comprehensive review of the topic and compared 160 KM frameworks.

He found that a wide range of terms were used. However, the question arises as to how the KM framework models that are commonly utilized for TPPI may be applied.

## **II.1 Theoretical Foundation**

### **II.1.1 Knowledge Management**

Wilson & Sharples (2015) and Kitimbo & Dalkir (2013) both emphasize the importance of knowledge and experience in today's project economy. Knowledge is the information and skills acquired through experience or education, while experience is the knowledge or skill acquired by a period of practical experience.

Nonaka & Takeuchi (1995) point out that the knowledge that drives an organization has direct implications for management functions and its entire structure, i.e. its operating systems, technology, and organizational procedures. All people who work in a particular organization are becoming knowledge workers.

Tjakraatmadja & Lantu (2006) concluded that knowledge is derived from a body of data that has been connected in a way that gives it context. Data that has been processed and displayed in a form that can be communicated through language, graphs, or tables is where information is found. Three categories can be used to group the various ways humans have learned to understand the world. Three categories can be used to group the various ways that humans have learned to understand the world; cultural knowledge; tacit knowledge; and explicit knowledge. Knowledge management focuses on making people more productive in increasing their knowledge and eager to share what they know. It involves creating a conducive learning environment to motivate workers to continue learning, take advantage of the information or knowledge provided by the company, and develop their individual knowledge. Tjakraatmadja & Lantu (2006) explains that knowledge management focuses on making people more productive and eager to share what they know.

Quinn et al. (1992) define an intelligent organization as one that can continuously develop its advantages from activities based on information and services by leveraging its intellectual property. Each member of the business should be motivated to grow their expertise, leverage existing technology, or respond to consumer requests more creatively. Knowledge management is considered as the culmination and integration of earlier organizational strategies. Knowledge management can assist intelligent learning enterprises. An intelligent organization is one that can use its intellectual property to enhance its superiority over time through knowledge-based activities and services. As a result, the significance of knowledge management for businesses might be summarized as follows; Developing organizational knowledge as the main capital to increase the company's competitiveness; The establishment of a conducive learning environment; Developing individual knowledge within the organization, so that in the end, it creates an atmosphere of sharing new knowledge to become organizational knowledge.

### **II.1.2 Asian Productivity Organization (APO) Framework**

The Asian Productivity Organization (APO) is an intergovernmental organization dedicated to increasing productivity in the Asia-Pacific area. It has produced a framework that is shared by all member nations (Bangladesh, Cambodia, China, Fiji, Hong Kong, India, Indonesia, Iran, Japan, South Korea, Laos, Malaysia, and Mongolia). It is organized along three axes: knowledge accelerators, knowledge processes, and results in terms of productivity, quality, profitability, and growth. The APO KM Framework is one of many KM frameworks that highlights the need of knowledge management for organizational success. It was created to boost small and medium-sized companies in the member countries, with the intention of maximizing the most of its benefits by providing a quick start. (Freire et al., 2021, p. 57)

The assessment of readiness level of knowledge management is executed based on the APO Framework. In this method, a questionnaire has been designed to identify the status of an organization in terms of knowledge management. The questions raised in the questionnaire are based on the seven elements contained within the framework of this model. The framework for this model begins with the recognition of the vision, mission, organizational goals, and strategic paths. This assists the organization in analysing its core capabilities and abilities and identifying those that need to be developed and improved. The four accelerators (individuals, processes, technology, and leadership) can help the organization understand how these effective factors influence the organization and can help the organization use and apply knowledge management successfully. The five main knowledge processes (identification, creation, storage, sharing, and use of knowledge) provide an initial assessment of existing knowledge management activities that can be applied in a timely manner when implementing knowledge management. Organizations may use knowledge management unconsciously on occasion. The outcomes of knowledge management efforts assess the effectiveness of knowledge management processes that are supported by critical success factors (accelerators, perspectives, and missions). These outcomes should be able to demonstrate the advancement of learning and innovation, which results in the development of individual, team, organizational, and social capabilities, and ultimately leads to improved service quality, productivity, profitability, and organizational growth. The APO KM Assessment Tool includes

seven audit categories based on the Framework's key elements; KM Leadership; Process; People; Technology; Knowledge Process; Learning and Innovation; KM Outcomes.

### **II.1.3 Analytic Hierarchy Process (AHP)**

Introduced by Thomas L. Saaty in 1980, AHP is an effective tool for dealing with complex decision-making, and may aid the decision maker to set priorities and make the best decision. The AHP is the most suitable Multi Criteria Decision Making Methods (MCDM) for the areas of application related to performance type problems, resource management, corporate policy and strategy, public policy, political strategy, and planning. Saaty (2008) explained that The AHP is a theory of measurement through pairwise comparisons. It relies on the judgements of experts to derive priority scales among alternatives. The comparisons are made using a scale of absolute judgements that represents how much more one element dominates another with respect to a given attribute. The priority scales are synthesized by multiplying them by the priority of their parent nodes and adding for all such nodes.

Yang & Shi (2002) pointed up that the AHP approach involves decomposing a complex problem into a set of components organized in a multilevel hierarchic form. A salient feature of the AHP is to quantify decision makers' subjective judgments by assigning corresponding numerical values based on the relative importance of criteria. A conclusion can be reached by synthesizing the judgments to determine the overall priorities of alternatives.

Velasquez & Hester (2013) spotted that the advantages are easy to use; scalable; hierarchy structure can easily adjust to fit many sized problems; and not data intensive. The disadvantages are problems due to interdependence between criteria and alternatives; may lead to inconsistencies between judgment and ranking criteria; and rank reversal.

### **II.1.3 Interview**

The format of an interview might range from entirely structured to completely unstructured. Semi-structured interviews fall between the extremes of this spectrum. The theory of interest is the interview's main theme. Before beginning interviews, the researcher deduces predetermined topics and issues from the theory of interest and generates at least some specific questions. The interviewer is told to look for theoretical details, nuances, and contradictions within and across the pre-set themes. The researcher can make judgments about the theory's corroboration or falsification based on whether enough of the theory was tested (i.e., adequate coverage of the theory's conceptual domain) and the nature and extent of the identified theoretical inconsistencies using the responses to the predetermined and follow-up questions. (Lee, 1999, p. 63)

In the Lee et al. (1996) study, for example, we acquired self-reports from participants via semi-structured interviews on the expected occurrence and non-occurrence of the choice routes' important qualities. We inferred theoretical support when crucial features happened and did not occur as expected by the unfolding model. We inferred the theoretical falsification when (a) important aspects occurred but were not predicted, and (b) essential features did not occur but were predicted.

## **II.2 Conceptual Framework**

As indicated in figure II.2, the researcher intends to link current thinking and research findings related to knowledge management to establish a purpose theoretical framework describing the association with knowledge management practice. The framework is an enrichment from Che et al. (2012) and Khalifa et al. (2013) studies.

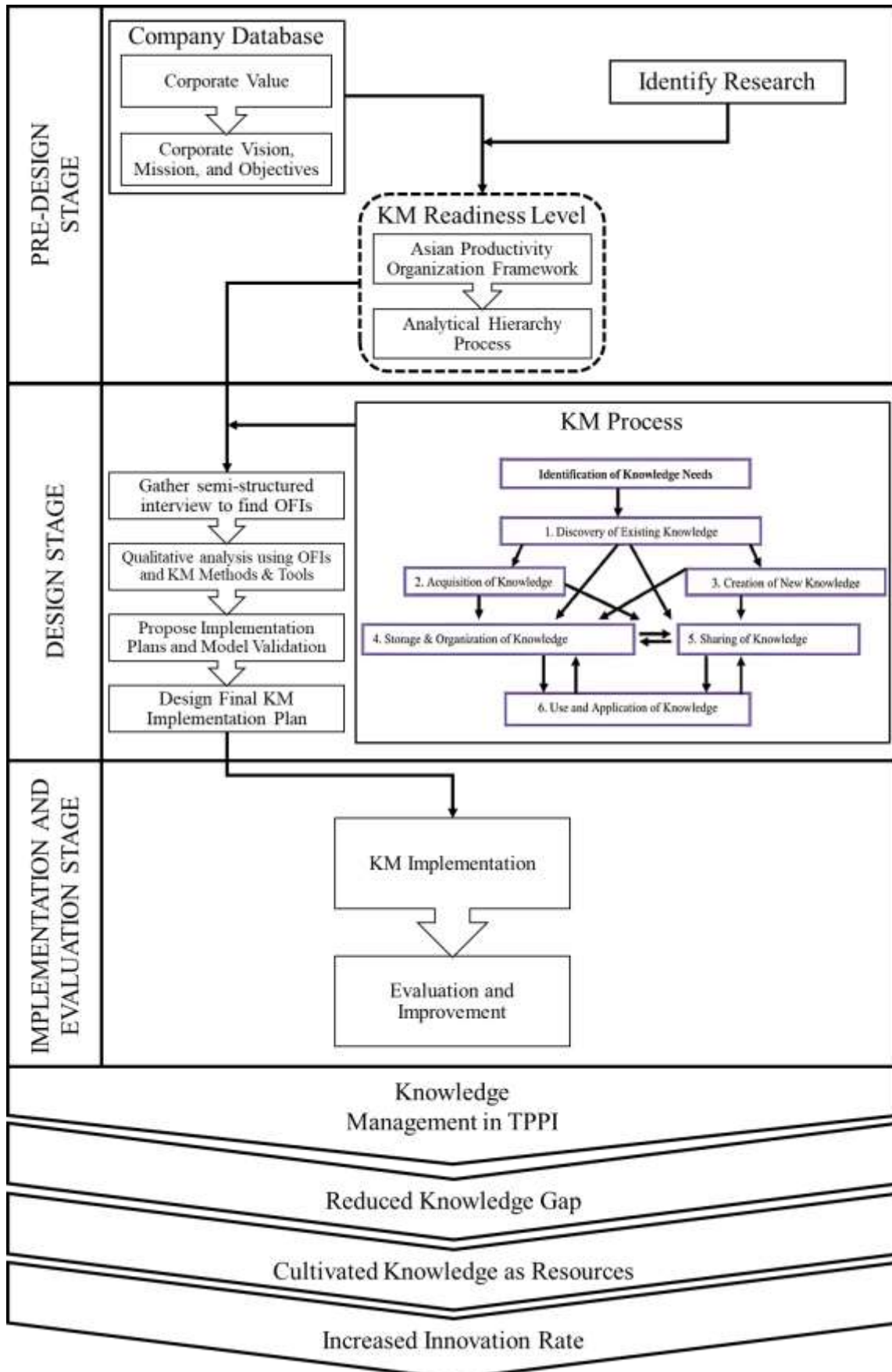


Figure II.1 Conceptual Framework (Source: Author, 2023)

### III. RESEARCH METHODOLOGY

According to Kothari (2004), the main goal of research is to help the reader discover the truth that is hidden through the application of scientific procedures. Methodology determines the outcomes of any study, and it is critical to select an appropriate method for conducting research methods in order to meet the researcher's aims and objectives. Using research methods will make it easier for researchers to develop strategies, define processes, and techniques to be used in data collection and analysis.

#### III.1 Research Design

In this paper, the researcher used mixed-methods research, which combines elements of quantitative and qualitative research, in order to answer the research questions. Mixed methods can help to gain a more complete picture than a standalone quantitative or qualitative study, as they integrate the benefits of both methods. Combining the two types of data means gaining the benefit of both detailed, contextualized insights from qualitative data and generalizable, externally valid insights from quantitative data. The advantages of one type of data frequently outweigh the disadvantages of the other. Specifically, the mixed-methods research design type used in this paper is exploratory-sequential. Quantitative data collection and analysis come first in an exploratory sequential design, followed by qualitative data collection and analysis.

According to the literatures review, the results of the KM assessment using APO can be used as an approach to be implemented in organizational or company policies and programs. In practice, survey results may be moderate, with values indicating measurement results for each category, which tend to be homogeneous. Furthermore, in practice, one category may have a higher total point but very low sub-categories results. Of course, the conclusions drawn from these measurements will have an impact on the design approach to KM implementation. Because of these possibilities, the researcher is interested in attempting a strategic decision-making approach using the AHP method in determining the prioritization. Afterward, the researcher chooses the two lowest categories to use semi-structured interviews with the keypersons to do qualitative analysis in terms of developing business solutions and their implementation plans. The process flowchart is shown in the figure III.1.

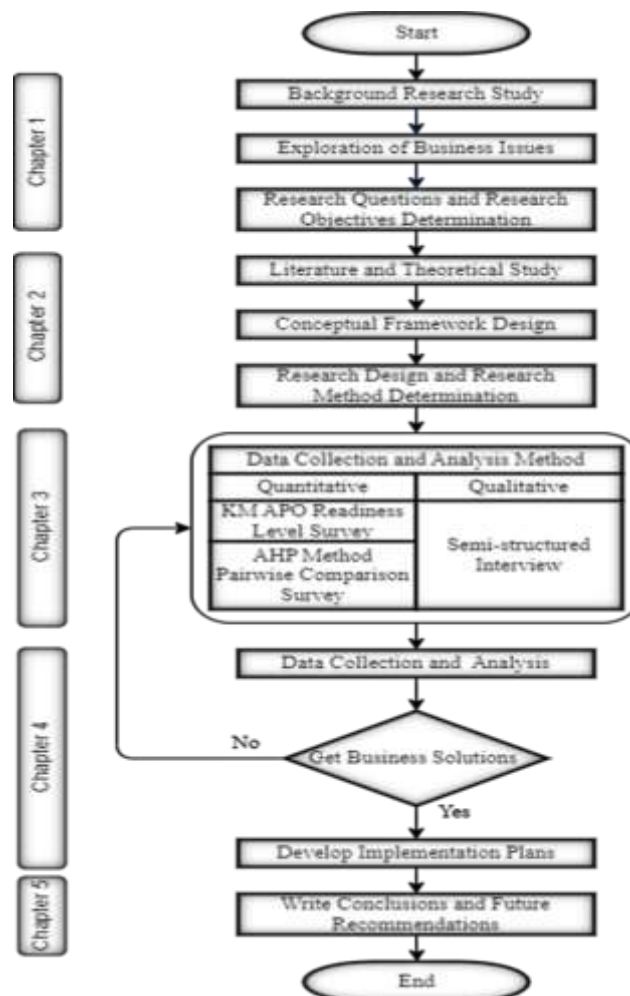


Figure III.1 Research Design Flowchart (Source: Author, 2023)

**III.2 Data Collection Method**

Quantitative and qualitative data collection is carried out for further quantitative and qualitative analysis.

**III.2.1 Readiness Level of Knowledge Management – APO Framework**

The instrument for collecting information in this research is the standard questionnaire of the Asian Performance Organization Model (APO) which consists of the following components Leadership (6 questions); Process (6 questions); People (6 questions); Technology (6 questions); Knowledge Processes (6 questions); Learning and Innovation (6 questions); Outcomes (6 questions). Each category with a maximum score of 30, and each item or question, will be in accordance with the following scoring guidance; 1 (Very Poor); 2 (Poor); 3 (Adequate); 4 (Good); 5 (Very Good). The questionnaire is given through online survey or self-administered survey using google forms.

**III.2.2 Pairwise Comparison Survey – AHP Method**

The purposes of the pairwise comparison survey for all factors (criteria, sub criteria and ratings) are to elicit the pairwise comparison judgements throughout the hierarchy structure of the AHP, i.e. among the criteria with respect to the decision goal; among the sub criteria with respect to their parent criterion; and among the ratings or grades with respect to each associated sub criterion. The pairwise comparison will provide feedback to the respondents associated with consistency of their judgements and agree with each other to get the improved judgements within tolerable consistency. The pairwise comparison is performed by comparing the relative importance between two factors (criteria, sub criteria or ratings) which are measured according to a numerical scale from 1 to 9 with scale interpretation as follows; 1 (Equal importance); 3 (Moderate importance of one over another); 5 (Strong or essential importance of one over another); 7 (Very strong importance of one over another); 9 (Extreme importance of one over another); 2, 4, 6, 8 (Intermediate values between the two adjacent judgements). The importance level of respondents is to provide weighting of the respondents in group decision making by using the formula of weighted geometric mean for aggregation of individual priorities (AIP). In this case, the respondents are grouped by four level of importance, i.e. AIP score 5 (the most importance) until AIP score 1 (the lowest importance), as defined; AIP Score 5: Vice Presidents/Equal; AIP Score 4: Section Head/Equal; AIP Score 3: Manager/Assistant Manager/Deputy Manager/Equal; AIP Score 2: Sr. Supervisor/Supervisor/Jr. Supervisor/Sr. Engineer/Jr. Engineer/Equal; AIP Score 1: Staff/Operator/Technician/Others.

**III.2.3 Semi-structured Interview**

The semi-structured conversational interview is used in qualitative research, but sits on the unstructured end. The interviewer pursues prepared themes and is free to dig for extra significance. It is useful for producing theory and testing theory efficiently. Semi-structured interviews are a hybrid of structured and unstructured formats, with an overarching topic, general themes, targeted topics, and questions in predefined order. The interviewer is allowed to pursue issues as they arise, unlike structured interviews. A pre-set interview schedule and advised interviewers to freely investigate emergent subjects and themes. The semi-structured interview, unlike the structured interview, requires great interviewer abilities and should strike a mix between unstructured and guided discourse. It requires great interviewer abilities and is similar to the unstructured format. (Lee, 1999)

In this paper, researcher conducted semi-structured interviews with Vice President (VP) level as the keypersons using statements from the selected APO framework categories (six in each category) to request for recommendations and follow-up implementation of the selected issue categories.

**III.3 Data Analysis Method**

**III.3.1 Quantitative Data Analysis**

**A. Measurement of Readiness Level of Knowledge Management**

The following steps are used in measuring the readiness level of knowledge management.

**1. KM Result Analysis**

The responses from the survey is collected and calculated to be categorized into the APO Framework standard as follows.

**Table III.1 Organizational Position in APO Model (Source: APO, 2020)**

Level	Description	Score				
Readiness	KM is mainstreamed in the institution	189-210				
Refinement	KM implementation is continuously evaluated and improved		147-188			
Introduction	KM practices in some areas			126-146		

<b>(Expansion)</b>						
<b>Initiation</b>	Beginning to recognize the need to manage knowledge				84-125	
<b>Reaction</b>	Not aware of what KM is and its importance in enhancing productivity and competitiveness					42-83

2. **Check minimum sample size required using Cross-sectional Research Sample Formula**

Wang & Ji (2020) explained that for the survey, which is a descriptive and observational study design, it is possible to determine the minimum sample size using the cross-sectional research sample formula as shown in figure III.2.

$$n = \frac{Z^2 \cdot p \cdot (1-p) \cdot N}{d^2(N-1) + Z^2 \cdot p \cdot (1-p)}$$

n : Sample size  
 N : Population size  
 p : Prevalence of the study event  
 q : 1-p  
 Z $\alpha$  : the value in the Gaussian distribution  
 d : Error tolerance

Figure III.2 Cross-sectional Research Sample Formula (Source: Cvetkovic-Vega et al., 2021)

3. **Determine validity of measurement using Pearson’s correlation**

The Pearson’s correlation was employed in the validity test. Pearson’s correlation analysis (correlated bivariate) is a method for determining the linear relationship between two variables (Nugroho et al., 2014). Correlation analysis is performed in this study to determine the validity of the test or questionnaire utilized. It is used to determine the level of relevance between issues. If the Pearson correlation is greater than the r-table, the items are valid. According to Gunawan and Sunardi (2016), the generated data is valid if the r count is bigger than the r-table. This research calculated the validity using Microsoft Excel’s formula "CORREL," which was later evaluated by the r-table in the appendix A. This table is used to validate data by comparing the findings of r-count data variables with r-table at a specific level of confidence and df (degree of freedom) df=n-2, where n is the number of respondents included in the analytical process. In this research, the specific r-table used is 0,01.

4. **Determine reliability of measurement using Cronbach’s Alpha correlation**

Cronbach’s alpha is a measure used to assess the reliability or internal consistency of a set of scale or test items. In other words, the reliability of any given measurement refers to the extent to which it is a consistent measure of a concept, and Cronbach’s alpha is one way of measuring the strength of that consistency. Cronbach’s alpha is computed by correlating the score for each scale item with the total score for each observation and then comparing that to the variance for all individual item scores. In this paper the calculation is done using Microsoft Excel. The formula used to determine reliability are shown in figure III.3 and III.4.

$$\alpha = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum_{i=1}^k \sigma_{i_i}^2}{\sigma_{\Sigma}^2} \right)$$

where:  $k$  refers to the number of scale items  
 $\sigma_{i_i}^2$  refers to the variance associated with item  $i$   
 $\sigma_{\Sigma}^2$  refers to the variance associated with the observed total scores

Figure III.3 Cronbach’s Alpha defined formula (1) (Source: Goforth, 2015)

$$\alpha = \frac{k \times \bar{c}}{\bar{v} + (k-1)\bar{c}}$$

where:  $k$  refers to the number of scale items  
 $\bar{c}$  refers to the average of all covariances between items  
 $\bar{v}$  refers to the average variance of each item

Figure III.4 Cronbach’s Alpha defined formula (1) (Source: Goforth, 2015)

B. **Pairwise Comparison Matrices**

The method to calculate a priority vector is proposed by Thomas L. Saaty, and the method stems from the following observation: Taking a matrix, A (m x m), where m is the number of criteria, whose entries are obtained as ratios between weights, and multiplying it by w, the equation follows.

$$Aw = \begin{pmatrix} w_1/w_1 & w_1/w_2 & \dots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \dots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \dots & w_n/w_n \end{pmatrix} \begin{pmatrix} w_1 \\ \vdots \\ w_n \end{pmatrix} = \begin{pmatrix} nw_1 \\ \vdots \\ nw_n \end{pmatrix} = nw$$

Figure III.5 Pairwise Comparison Matrix (Source: Saaty, 2008)

We know that a formulation of  $Aw = nw$  implies that  $n$  is an eigenvalue and  $w$  is an eigenvector of matrix  $A$ . Vector  $w$  (priority vector) can be obtained from any pairwise comparison matrix  $A$  as the solution of the following equation system, where  $\lambda_{max}$  is the maximum eigenvalue of  $A$ .

$$\begin{cases} Aw = \lambda_{max}w \\ w^T \mathbf{1} = 1 \end{cases}$$

Figure III.6 Eigenvalue (Source: Saaty, 2008)

The consistency index (CI) is obtained by first computing  $\lambda_{max}$  as the principal eigen value.  $\lambda_{max}$  for consistent reciprocal matrix is equal to the number of comparisons,  $\lambda_{max} = m$ . Saaty (2008) has proposed a consistency index (CI) which is related to the eigenvalue method.

$$CI = \frac{\lambda_{max} - m}{m - 1}$$

Figure III.7 Consistency Index (Source: Saaty, 2008)

A perfectly consistent decision maker always obtains  $CI = 0$ , but small values of inconsistency may be tolerated. If the consistency ratio (CR) where  $RI$  is random index, the consistency of judgement is tolerable. If  $CR$  is greater than 0.10, the judgment shall be improved.

$$CR = \frac{CI}{RI} \leq 0.10$$

$m$	2	3	4	5	6	7	8	9	10
$RI$	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.51

Figure III.10 Consistency Ratio Formula and Illustration (Source: Saaty, 2008)

### III.3.2 Qualitative Data Analysis

The main techniques for analysing qualitative data involve various applications of sorting, organizing, and indexing data (Mason, 1996). The following sources explained the how to do qualitative data analysis.

- Maxwell (1996) suggests that theoretical memos be used for data sorting, structuring, and indexing (or coding). The data is analysed, categorized, re-examined, and recategorized through a series of theoretical memos, which compare and contrast the researchers' assertions and contextualize the data.
- Coffey & Atkinson (1996) present two creative data analysis modes: dissect and condense, which is similar to statistical factor analysis in that the underlying latent roots of the data are identified, and reconstruct and expand, which alters, reconceptualizes, and complicates the facts. Heuristic devices are used to reconstruct and expand data, similar to statistical factor analysis, by identifying the underlying latent roots.
- According to Chase (2005) narrative design is a mode of inquiry in qualitative research and it has a specific focus on the stories told by individuals. Research is the investigation of an individual and their experiences, focusing on one or two individuals, collecting data through tales, documenting individual experiences, and organizing the meaning of those experiences. As Bekele and Ago (2022) explained, the sample size for the interview in narrative research is one or two people.

## IV. RESULTS AND DISCUSSION

### IV.1 APO KM Readiness Level Analysis

The APO KM assessment being taken by 78 employees from total of 468 employees using google form survey which is fulfilled the minimum 60 sample size criteria based on figure III.2 equation with assumptions; maximum heterogeneity; 90% confidence level ( $\alpha=0,1$  thus  $Z\alpha=1,645$ ); and 10% margin of error.

The calculation details are available in the

[https://drive.google.com/drive/folders/1lhcpSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share\\_link](https://drive.google.com/drive/folders/1lhcpSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share_link).

The distribution of respondents is explained by figure IV.1.



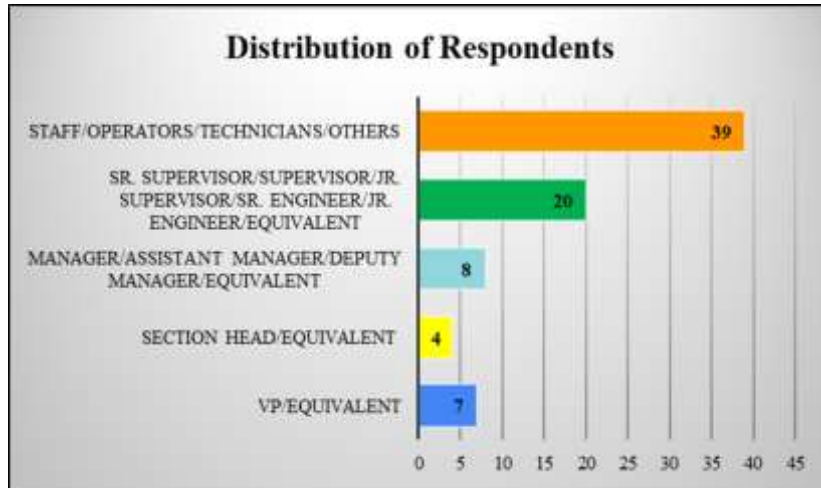


Figure IV.1 Distribution of Respondents (1) (Source: Author, 2023)

IV.1.1 APO KM Readiness Level Assessment Per-Categories Result

The result of the assessment per categories is given on table IV.1 to table IV.7 as follows.

Table IV.1 Assessment Result: Category 1.0 Leadership (Source: Author, 2023)

NO	CATEGORY 1.0 LEADERSHIP	SCORE
1	The organization has a shared Knowledge Vision and Strategy strongly linked to the organization’s vision, mission, and goals.	4
2	Organizational arrangements have been undertaken to formalize KM initiatives (i.e., central coordinating unit for knowledge/information management, Chief Knowledge/Information Officer, ICT team, quality improvement teams/ Communities of practice, knowledge networks).	4
3	Financial resources are allocated for KM initiatives.	4
4	The organization has a policy for safeguarding knowledge (i.e., copyrights, patents, KM, and knowledge security policy).	4
5	Managers role-model 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/divisions/units.	3
6	Management promotes, recognizes, and rewards performance improvement, organizational and employee learning, sharing of knowledge, and knowledge creation and innovation.	3
<b>SUBTOTAL</b>		<b>22</b>
<b>Reliability (Cronbach’s Alpha Score)</b>		<b>0,86 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>(Valid)</b>

Table IV.2 Assessment Result: Category 2.0 Process (Source: Author, 2023)

NO	CATEGORY 2.0 PROCESS	SCORE
7	The organization determines its core competencies (strategically important capabilities that provide a competitive advantage) and aligns it to their mission and strategic goals.	3
8	The organization designs its work systems and key processes to create value to customers and achieve performance excellence.	3
9	New technology, knowledge shared in the organization, flexibility, efficiency, and effectiveness are factored into the design of processes.	3
10	The organization has an organized system for managing crisis situations or unforeseen events that ensures uninterrupted operations, prevention, and recovery.	3
11	The organization implements and manages its key work processes to ensure that customer requirements are met and business results are sustained.	3
12	The organization 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	2
<b>SUBTOTAL</b>		<b>17</b>
<b>Reliability (Cronbach’s Alpha Score)</b>		<b>0,87 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

Table IV.3 Assessment Result: Category 3.0 People (Source: Author, 2023)

NO	CATEGORY 3.0 PEOPLE	SCORE
13	The organization’s education, training, and career development program builds employee knowledge, skills, and capabilities, supports achievement of overall objectives, and contributes to high performance.	3
14	The organization has a systematic induction process for new staff that includes familiarity with KM and its benefits, the KM system, and tools.	3
15	The organization has formal mentoring, coaching, and tutoring processes.	3
16	The organization has a database of staff competencies.	2
17	Knowledge sharing and collaboration are actively encouraged and rewarded/corrected.	3
18	Employees are organized into small teams/groups (i.e., quality circles, work improvement teams, cross-functional teams, communities of practice) to respond to workplace problems/concerns.	3
<b>SUBTOTAL</b>		<b>17</b>
<b>Reliability (Cronbach’s Alpha Score)</b>		<b>0,87 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

Table IV.4 Assessment Result: Category 4.0 Technology (Source: Author, 2023)

NO	CATEGORY 4.0 TECHNOLOGY	SCORE
19	Management has established an IT infrastructure (i.e., Internet, intranet, and website) and has developed capabilities to facilitate effective KM.	4
20	The IT infrastructure is aligned with the organization’s KM strategy.	3
21	Everyone has access to a computer.	4
22	Everyone has access to the Internet/intranet and an email address.	4
23	Information delivered in the website/intranet is updated on a regular basis.	3
24	Intranet (or similar network) is used as a major source of organization-wide communication to support knowledge transfer or information sharing.	4
<b>SUBTOTAL</b>		<b>22</b>
<b>Reliability (Cronbach’s Alpha Score)</b>		<b>0,86 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

Table IV.5 Assessment Result: Category 5.0 Knowledge Process (Source: Author, 2023)

NO	CATEGORY 5.0 KNOWLEDGE PROCESS	SCORE
25	The organization has systematic processes for identifying, creating, storing, sharing, and applying knowledge.	3
26	The organization maintains a knowledge inventory that identifies and locates knowledge assets or resources throughout the organization.	3
27	Knowledge accrued from completed tasks or projects are documented and shared.	3
28	Critical knowledge from employees leaving the organization is retained.	3
29	The organization shares best practices and lessons learned across the organization so that there is no constant re-inventing of the wheel and work duplications.	3
30	Benchmarking activities are conducted inside and outside the organization, the results of which are used to improve organizational performance and create new knowledge.	3
<b>SUBTOTAL</b>		<b>18</b>
<b>Reliability (Cronbach’s Alpha Score)</b>		<b>0,92 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

Table IV.6 Assessment Result: Category 6.0 Technology (Source: Author, 2023)

NO	CATEGORY 6.0 LEARNING AND INNOVATION	SCORE
31	The organization articulates and continually reinforces the values of learning and innovation.	3
32	The organization regards risk taking or committing mistakes as learning opportunities, so long as they are not performed repeatedly.	3
33	Cross-functional teams are organized to tackle problems/concerns that cut across the different units in the organization.	3
34	People feel empowered and that their ideas and contributions are generally valued by the organization.	3
35	Management is willing to try new tools and methods.	2
36	Individuals are given incentives to work together and share information.	3
<b>SUBTOTAL</b>		<b>17</b>
<b>Reliability (Cronbach's Alpha Score)</b>		<b>0,90 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

Table IV.7 Assessment Result: Category 7.0 KM Outcomes (Source: Author, 2023)

	CATEGORY 7.0 KM OUTCOMES	SCORE
37	The organization has a history (and maintains measures) of successfully implementing KM and other change initiatives.	3
38	Measures are in place for assessing the impact of knowledge contributions and initiatives.	3
39	The organization 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.	3
40	The organization has increased its profitability as a result of productivity, quality, and customer satisfaction improvements.	3
41	The organization has improved the quality of its products and/or services as a result of applying knowledge to improve business processes or customer relationships.	3
42	The organization has sustained growth as a result of higher productivity, increased profitability, and better quality product and services.	3
<b>SUBTOTAL</b>		<b>18</b>
<b>Reliability (Cronbach's Alpha Score)</b>		<b>0,90 (Reliable)</b>
<b>Validity (Pearson Correlation)</b>		<b>Valid</b>

**IV.1.2 APO KM Readiness Level Assessment Overall Result**

Through illustrations from figure IV.2 (radar chart) and table IV.8, it is found that the KM readiness level gap for each category is almost similar between 8 – 13. The category with the highest readiness level gap is Process, People, and Learning and Innovation with an average score of 17 and the category with the lowest readiness gap is Leadership and Technology with an average score of 22. Meanwhile the Knowledge Process and KM Outcomes are positioned in the middle with average score of 18. These gaps indicate how that all categories have to do gaps reduction through KM improvement.

Table IV.8 KM Readiness Level Overall Score (Source: Author, 2023)

KM Key Element (Category)		Maximum Score	Average Score	Gap
1.0	Leadership	30	22	8
2.0	Process	30	17	13
3.0	People	30	17	13
4.0	Technology	30	22	8
5.0	Knowledge Process	30	18	12
6.0	Learning and Innovation	30	17	13
7.0	KM Outcomes	30	18	12
<b>Total</b>		<b>210</b>	<b>131</b>	<b>79</b>

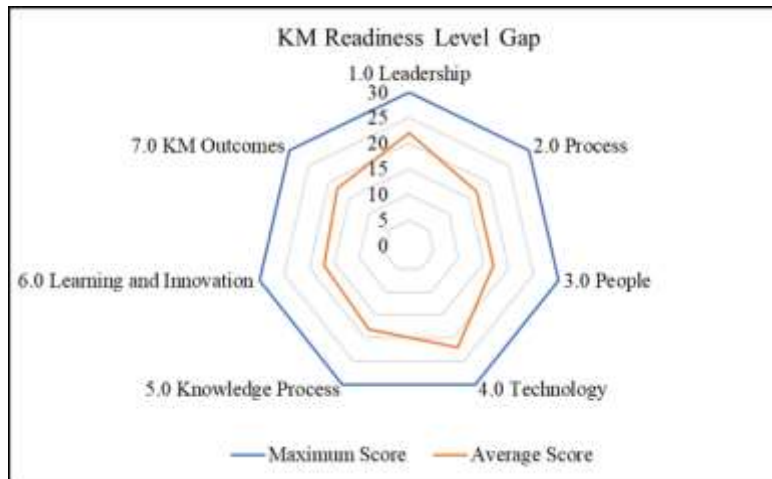


Figure IV.2 Radar Chart of KM Readiness Level Gap (Source: Author, 2023)

**IV.1.3 Prioritization of KM Readiness Level Category Using AHP Method**

Through the results of the assessment, the same score was found on several measurement components. Process, People, and Learning & Innovation had equal average score of 17; Knowledge Process and KM Outcomes had equal average score of 18; Leadership and Technology had equal average score of 22. Further analysis carried out using the AHP method to find the priority order of those result. The AHP data is taken through google form survey with 61 respondent’s involvement which is fulfilled the minimum 60 sample size criteria based on figure III.2 equation with assumptions; maximum heterogeneity; 90% confidence level ( $\alpha=0,1$  thus  $Z\alpha=1,645$ ); and 10% margin of error. The calculation details are available in the [https://drive.google.com/drive/folders/1hpcSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share\\_link](https://drive.google.com/drive/folders/1hpcSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share_link). The distribution of respondents is explained by figure IV.3.

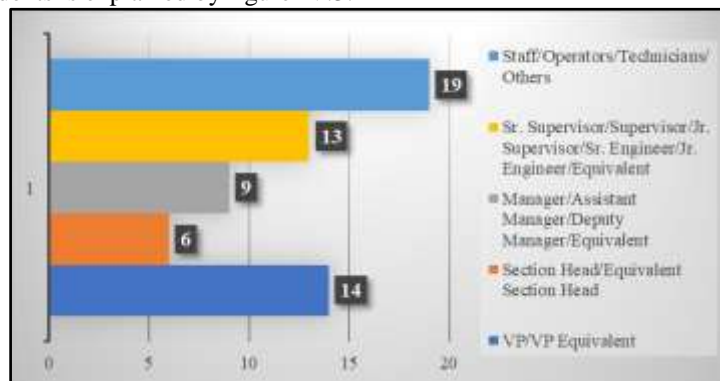


Figure IV.3 Distribution of Respondents (2) (Source: Author, 2023)

**IV.1.3.1 Process vs People vs Learning & Innovation**

The result of the calculation of the consistency ratio (CR) is 0.01 which is less than the limit value of 0.1 so that it can be accepted.

Table IV.9 EVN Calculation 1 (Source: Author, 2023)

Criteria	People	Process	Learning & Innovation	Total	EVN	Sequence
People	3,02	3,52	2,23	8,77	0,31	2
Process	2,60	3,02	1,92	7,54	0,27	3
Learning & Innovation	4,11	4,78	3,03	11,92	0,42	1
<b>Total</b>				28,22		
<b>Consistency Ratio (CR)</b>					0,01	

**IV.1.3.2 Knowledge Process vs KM Outcomes**

The result of the calculation of the consistency ratio (CR) is infinite because the random index (RI) of matrix 2x2 is zero. The concept of CR says if  $a > b$  and  $b > c$ , then  $a > c$ . It means that "a" is more important the "b" and "b" is more important that "c", then it should be saying "a" is strongly more important than "c".

Table IV.10 EVN Calculation 2 (Source: Author, 2023)

Criteria	Knowledge Process	KM Outcomes	Total	EVN	Sequence
Knowledge Process	2,02	5,54	7,56	0,73	1
KM Outcomes	0,74	2,02	2,76	0,27	2
<b>Total</b>			10,33		
<b>Consistency Ratio (CR)</b>			Infinite		

**IV.1.3.3 Leadership vs Technology**

The result of the calculation of the consistency ratio (CR) is infinite because the random index (RI) of matrix 2x2 is zero. The concept of CR says if a>b and b>c, then a>c. It means that "a" is more important the "b" and "b" is more important that "c", then it should be saying "a" is strongly more important than "c".

Table IV.11 EVN Calculation 3 (Source: Author, 2023)

Criteria	Leadership	Technology	Total	EVN	Sequence
Leadership	2,01	11,92	13,93	0,86	1
Technology	0,34	2,01	2,35	0,14	2
<b>Total</b>			16,29		
<b>Consistency Ratio (CR)</b>			Infinite		

**IV.1.3.4 Sequence of KM Readiness Level Category Urgency**

The overall KM readiness level categories then rearranged based on the results of the EVN calculation for each component with the same assessment score.

Table IV.12 Sequence of KM Readiness Level Criteria's Urgency

KM Key Element (Category)	Maximum Score	Average Score	Gap	Urgency Sequence
<b>1.0 Leadership</b>	30	8	22	<b>6</b>
<b>2.0 Process</b>	30	13	17	<b>3</b>
<b>3.0 People</b>	30	13	17	<b>2</b>
<b>4.0 Technology</b>	30	8	22	<b>7</b>
<b>5.0 Knowledge Process</b>	30	12	18	<b>4</b>
<b>6.0 Learning and Innovation</b>	30	13	17	<b>1</b>
<b>7.0 KM Outcomes</b>	30	12	18	<b>5</b>
<b>Total</b>	210	131	79	

**IV.2 Business Solution**

In light of the problem's restrictions, the researcher selected the two lowest scores from the KM category based on the readiness level measurement, namely learning and innovation and people. To investigate and generate business solutions, the researcher conducted semi-structured interviews with each of the main key players. The researcher chose vice presidents (VP) as keypersons, which is the highest role under the board of directors, to represent each department. The involvement is seven VPs participating out of ten, which fulfils the criteria of the one to two minimum number of interviewees in the narrative research.

Table IV.13 List of VP Involvement (Source: Author, 2023)

Name	Role
Ahmad Fanny Arsyad Temenggung	VP Corporate Secretary & Legal
Widayadi Suryawardono	VP Human Capital
Joko Purnomo	VP Procurement
Sutejo	VP Project Execution
Rochadi Sugeng Indrasakti	VP HSSE
Johannes Kurniawan Seber	VP Engineering & Reliability
Yusuf Rizal	VP Controller & Tax

**IV.2.1 KM Category Significant Finding Matrix**

The recorded semi-structured interviews provided information of strength and opportunities for improvement (OFI). These findings also became elementary matters for the researcher to develop business solutions and implementation plans. The complete transcripts and recorded interview links are available in the [https://drive.google.com/drive/folders/1lhcpSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share\\_link](https://drive.google.com/drive/folders/1lhcpSKkc33Q-DAHqHe4959X87pXQSaBo?usp=share_link) while the compilation of the interview result is shown as follows.

**Table IV.14 Significant Finding Matrix Learning & Innovation (1) (Sources: Author, 2023)**

Learning and Innovation	VP Corporate Secretary & Legal	VP Human Capital	VP Procurement
Strength	I think the quality of recruitment is good enough.	In this instance, learning and creativity remain mediocre/intermediate. Workers are still going about their daily business.	1) In terms of market placement, the government requires whatever the TPPI business is. As a result, there is no need for promotion. Actually, we only need to concentrate on how to create efficiently and cheaply. Our market is vast, both domestically and internationally. 2) Fundamentally, TPPI's Human Resources are willing to take the initiative and be adaptable in their work.
OFI	1) Fill in vacant positions so that the work load is fulfilled, because currently employees are more focused on completing operational work; 2) Make people happy first by providing incentives and rewards for innovation; 3) There is the creation of a learning system in the form of a digital library; 4) The need for encouragement to enrich the culture of reading and discussion; 5) Management does not yet have a commitment to focus on learning itself, so there must be a change in attitude and encouragement from management; 6) Overhauling the system: yes, the system must be made because the old system actually existed but didn't work. The first step was to fill in the OPD (Organization People Development) manager.	1) In general, initiatives must be implemented from the top down in order to be effective. There must be clear guidelines and systems in place, as well as strong encouragement to provide prizes and incentives. Coercive directives, in addition to material prizes and incentives, are very likely to be implemented if combined with obligations that are intimately tied to the employee performance rating process. 2) It is required to investigate and evaluate the entire organizational structure connected to the management of learning and innovation at TPPI, whether it will remain as is or join as a unit as part of the larger HC family. 3) Colleagues who have the opportunity to acquire training must share it not only internally, but also across functions, so that knowledge can be expanded on to other individuals and innovation can occur. 4) Systems and methods for documenting invention efforts, both individually and in groups, are required. 5) Requires mechanisms and procedures for evaluating innovation outcomes. For example, a two-way dialogue between innovators and SME (Subject Matter Expert) can be held so that they can follow the grow method principles and conduct a thorough examination of the ideas.	1) Demands shared commitment from top management. 2) Communication between TPPI Management and Holding Company Management may remain a challenge. In my perspective, the bureaucracy is still too cumbersome and an impediment, and it must be remedied promptly. 3) If you have a good idea, it must be thoroughly tested. If it is demonstrated that it can improve efficiency, production, or corporate performance, remuneration must be provided, such as what percentage of revenue is reached. This is critical for instilling in employees the desire to innovate. 4) The current CIP program is fine, but it does not address the core concerns at TPPI. This means that it is merely useful for dialogue because it has not yet been implemented. 5) Due to a lack of staff, employees are currently overburdened with operational tasks. It is critical to examine the organizational structure. I believe a comparative study with the organizational structure of the Parent Company's Refinery Unit (RU) may be completed quickly and accurately.

**Table IV.15 Significant Finding Matrix Learning & Innovation (2) (Sources: Author, 2023)**

Learning and Innovation	VP Project Execution	VP Engineering & Reliability	VP HSSE	VP Controller & Tax
Strength	When we wish to go to something more established, the organization's immaturity is actually an opportunity to innovate a lot. Furthermore, this space is solely dependent on two factors: people resources and management.	1) In general, TPPI employees have a high level of integrity. 2) TPPI has senior employees that can serve as role models since they are eager to learn new things and are open to new ideas.	TPPI is actually more advanced in terms of concern/initiative toward the region or factory, despite the fact that there was previously no direction for reporting Unsafe Acts and Unsafe Conditions. In fact, I believe that the online reporting of	1) TPPI is not discouraged and works hard. Had ups and downs and losses, but was able to restart operations effectively and is currently improving. 2) TPPI's past experience can be
OFI	1) In general, the culture of accepting and valuing mistakes as part of the learning process needs to be strengthened. Investigation reports prepared in accordance with business procedures in the event of an error remain at the technical level, and so do not cover non-technical issues. This has to be fixed or enhanced to ensure that everything is properly documented. 2) Risk management must be completely measured, comprehensive, recorded, and managed ideally. Risk management, including the analysis of positive and negative repercussions, must be carried out at every organizational stage, such as when developing policies, experimenting with new methods and technologies, and so on. 3) Encouragement for colleagues to innovate must be committed internally, first with management and subsequently being begun by HR. 4) Externally, comparative study programs to parent firms, similar companies, organizations, and institutions, as well as collaboration with universities of higher learning, can improve learning and creativity. Additional collaborative programs, such as holding employee recruiting from the best university graduates, can be implemented. 5) It is necessary to change the thinking of colleagues. Every employee is responsible for creating a culture of change. Each employee may objectively judge TPPI's position in comparison to other companies, and it is reasonable for coworkers to grumble about money, facilities, and so on. Colleagues can review whether what was obtained at TPPI is adequate using objectivity. That is not to say I don't want to improve, but I also want to insist that colleagues recognize the achievements they have made to TPPI so that they can continue to work and contribute optimally and help TPPI grow even stronger.	1) All failures or occurrences in the form of learning processes must be recorded in a single document and maintained in a database accessible to all levels of employees. 2) A cross-functional team must be formed not to solve a problem, but to prevent it from happening in the first place. If you are used to working together on the source of problems that can be perceived from many points of view, this will carry over to the completion of operational and/or specific work. 3) In general, HR need significant support from top management to stimulate learning and innovation. 4) So that all work achievements and innovations at the individual level can be recorded, praised, and rewarded in the future.	1) In my opinion, it is critical to have support from top management to repair corroded refinery equipment. Learning and innovation can be used to manage analyses, studies, and even the formation of a team to explore, for example, which equipment needs to be replaced or is still sufficient to be painted. 2) In general, more incentives and prizes are needed to encourage colleagues to learn and create. 3) Top Management should encourage the provision of more enhanced rewards or incentives. In the realm of safety, risk allowances must be made, particularly for workers who are directly affected by high work hazards, because in realistic conditions, workers must sometimes face occurrences and find their own solutions to the difficulties they face.	1) All TPPI personnel must ensure that they put the interests of the corporation over their own. 2) Non-formal and formal sharing of leadership, management, expertise, and issue resolution is required between sections or leaders and all TPPI employees. The proposal will be discussed at the VP-Manager level once a week. Later, colleagues at the staff level might continue to share their experiences, concerns, or complaints in order to discover solutions not only at the individual level, but also at the corporate level. 3) It is critical to establish the idea that every function contributes. To avoid demotivation, respect should be applied equally to all functions. 4) Employees can be rewarded through promotion and evaluation (and modifications) to the organizational structure. Work load analysis can be performed to analyze the organizational structure, with the results afterwards used for performance evaluation.

Table IV.16 Significant Finding Matrix People (1) (Sources: Author, 2023)

People	VP Corporate Secretary & Legal	VP Human Capital	VP Procurement
Strength	TPPI is actually filled with great-experienced people.	Although TPPI's human resources have a high performance spirit (fighting power), they are nonetheless focused on providing basic necessities.	The seniors at TPPI, in my opinion, are the greatest, most experienced, and chosen from the top firms. So, this was carried on with the selection of TPPI, which had high standards and only accepted people with high intelligence abilities.
OFl	<p>1) Enrich the culture of motivation to progress both in terms of the ecosystem and from superiors to subordinates. It is necessary to prepare the mindset of superiors so that they can encourage subordinates to progress and develop.</p> <p>2) Don't get caught up in operations, so apart from filling vacant positions, it is necessary to prepare systems and mechanisms for employee competency development and employee career development programs.</p> <p>3) Competency gaps should be filled by the company, not by employee initiative. The compilation of a competency matrix is a must.</p>	<p>1) In the context of human capital, the notion of learning and people development can be carried out in stages via profiling (competency identification), planning, learning, performance management, and people development.</p> <p>2) Employee career development will be more effective if it is carried out with an experimental proportion of 70% (through day-to-day jobs); 20% relationship based (through coaching, mentoring, and tutoring); and 10% educational based (through formal educational background). The competency matrix is our primary goal for completion so that it may serve as the foundation for compiling employee development programs such as training management and career development.</p> <p>3) A training tracking and tracing system is required. Modules are created digitally to make the tracking and tracing process easier, more effective, and efficient.</p> <p>4) Change initiatives will be more effective if they are initiated from the top down by management. All of these projects will be more effective if carried out by a small group of people who will act as agents of regeneration for a broader population group.</p> <p>5) The growth method can be used to measure the parameters of the coaching, mentoring, and tutoring process. Superiors must also be prepared with a thorough comprehension of the guidelines/syllabi so that they can be appropriately applied, and so that things that can improve employee and management/organizational performance can be examined. SMEs may also be involved both domestically and outside.</p> <p>6) The recruitment program is now uneven in terms of output and input, so it is a priority that must be met right away.</p>	<p>1) The need for a clear and equitable career development program at TPPI.</p> <p>2) The requirement for a comprehensive data collection system for each employee's competency.</p> <p>3) A review and appraisal of the organizational structure is required.</p> <p>4) The development of a system for recording coaching, mentoring, and tutoring processes.</p> <p>5) Financial remuneration in task forces must be clearly implemented in order for the implementation to be effective.</p>

Table IV.17 Significant Finding Matrix People (2) (Sources: Author, 2023)

People	VP Project Execution	VP Engineering & Reliability	VP HSSE	VP Controller & Tax
Strength	TPPI has a concept known as local wisdom. Each organization has its own set of local knowledge. That is what TPPI's identity must be investigated and developed. TPPI can learn from many parties, but it must emphasize its local knowledge.	TPPI has employees who are dedicated to their jobs. In desperate situations, they will provide everything, even if there are no guarantees or good recompense.	<p>1) TPPI offers a strong family work environment.</p> <p>2) Concern for coworkers and the factory/refinery.</p> <p>3) In terms of competency, TPPI personnel are equal to or even superior to those of other companies in many areas.</p>	TPPI has a lot of personal potential, which is regrettably not always well organized.
OFl	<p>1) It can be developed in the personnel database system program in combination with the career development system. For example, if a post is empty, a successor should be able to keep track of the necessary requirements. These data can be analyzed to determine whether the successor is possible.</p> <p>2) Repairs, controls, and improvements are required so that employees may properly carry out training and then grasp their obligations and responsibilities after conducting training in order to deliver benefits for TPPI.</p> <p>3) A section or PIC must initiate and supervise the formation of the task force team. To be able to assist strategic planning, HR must fill vacant positions as soon as possible.</p> <p>4) According to TPPI employees, it lacks discipline. Organizational and personal discipline are both lacking. This is a critical issue that must be resolved.</p>	<p>1) Employee's futures must be clarified. Employee career development modules, such as the STTP (Supervisor and Technician Training Program), which is structured and linked to a training program, must be reactivated. Career development programs can be repeated for civil officials, military/police, and even banking.</p> <p>2) The FRP (Forum Replacement Plant) program can be restarted in response to the succession of unfilled positions.</p> <p>3) A shift in perspective is required, as well as encouragement from management, in the process of transferring information and knowledge. Currently, the approach is only curative with little initiative.</p> <p>4) Large group scale sharing programs' ineffectiveness can be countered by developing small teams for more particular challenges or issues. Along with explicit reward and incentive regulations, not just in terms of monetary remuneration, but also in terms of career advancement.</p>	<p>1) Proactive HC training or education should be provided. Personnel who have not yet been assigned to people and development must be filled immediately.</p> <p>2) If the act of exchanging specific information, such as accident reporting, is regarded as a learning process, then these processes will naturally run more smoothly and prevent the occurrence of accidents or larger incidents.</p> <p>3) Giving rewards and incentives does not have to be expensive; simple presents such as t-shirts and gift cards can be an option.</p> <p>4) The organizational structure should be complied with and readjusted.</p> <p>5) The new employee induction process must be refined. Anyone who has to give content should coordinate all data needed by instructors or coaches that are more specific in nature. Materials can also be placed in a database to make it easier for mentors to locate documents.</p>	<p>1) At Pertamina, every new employee participates in employee training. It will be placed in the finances later, and all refineries will strive to rotate it in relation to the present process. We don't have any, unfortunately.</p> <p>2) It is critical and required to create an employee competency database. If the data is complete, the previously attended trainings do not need to be repeated, and just a refresher is required.</p> <p>3) Companies/management should value and motivate people across all functions. Congratulations and appreciation can sometimes make employees happy, valued, and motivated. But, in my opinion, it is not enough to stop there; firms must also offer material rewards and incentives for meeting targets and KPIs.</p> <p>4) TPPI must quickly prepare career development and regeneration programs. Before retiring, there should be a replacement ready to be mentored.</p>

#### **IV.2.2 Developing OFI as Business Solutions**

**1. Implementation of a balanced system of rewards and corrections.** Many interviews revealed a lack of gratitude for employees' triumphs or accomplishments, both at the individual and team levels, whereas corrections or punishments imposed as a result of failures were always consistently enforced. The mindset and will of management are a major reason for the lack of prizes, rewards, and incentives. One of the key factors that has an influence is the blurring of the boundaries between daily work tasks and obligations and achievement.

**2. Preparation and approval of the role competency matrix.** The matrix must be completed promptly and utilized as a collaborative guide in the implementation of effective and efficient training and career development, competency, and employee capabilities. The RASCI method approach can be used to prepare the role competency matrix, which must be developed based on user input from the relevant departments through discussion and agreement between the relevant management. The position competency matrix must subsequently be distributed to employees and labour unions.

**3. Career development programs need to be created and validated.** Employee career development programs must be established and disseminated by the company as soon as possible so that every employee has a career from the time they start working at TPPI until they retire. Career development programs can be tailored to each department's organizational structure and climate. For example, in the past, the STTP (Supervisor and Technician Training Program) was implemented, where subsequent technician roles may be divided into different levels to be filled and pursued by each eligible employee. Employee career development will be more effective if it is carried out with an experimental proportion of 70% (through day-to-day jobs), 20% relationship-based (via coaching, mentoring, and tutoring), and 10% educational-based (via formal educational background). Career development programs are eventually inextricably linked to organizational structure changes, the availability of company resources, and so on. As a result, monitoring and assessment are required in career development programs to ensure that they are always fixed, updated, and can adapt to changing dynamics. The POAC approach may be used to develop career development programs.

#### **IV.2.3 Developing KM Methods & Tools as Business Solutions**

Beside using OFI as terms of reducing the gaps, the need for a process model to develop knowledge management, which links to the APO five-step knowledge management process, is a must. This Five-Step KM process is concerned with five key steps; 1) Identifying knowledge; 2) Creating knowledge; 3) Storing knowledge; 4) Sharing knowledge; 5) Applying knowledge. As the first step, identification of the five steps that we wish to deal with in the KM implementation initiative led to a list of KM methods and tools to consider applying based on best KM practice. The chosen methods and tools are Knowledge Café; Communities of Practices; Collaborative Physical Workspaces; and Mentor/Mentee Scheme.

##### **IV.2.3.1 Knowledge Café**

At TPPI Knowledge Café, formal discussions about daily work in solving a problem, such as "What causes CIP participation to decrease from year to year?" or "Why is it so difficult to identify and form an effective coordination group in handling corrosion at the TPPI Refinery?" Aside from technical matters, the Knowledge Café can be a vehicle for discussing non-formal matters in the workplace as a place for sharing in order to create a harmonious, full-familial relationship in the workplace without high confrontation, such as regular discussions or meetings. When adopting the Knowledge Cafe, it is possible to consider providing a small promotion of rewards or incentives for participation in this activity, such as simply eating snacks and lunch together or prizes for the most active and prominent speakers.

##### **IV.2.3.2 Communities of Practices (COPs)**

At TPPI, COP creation can be used to solve a variety of challenges within or between departments. For example, a COP can be constituted to manage corrosion issues from representatives from related departments. Of course, the COP can design a structured program mechanism (appointment of coordinators and members; substitution of members; work targets within the timetable; supply of incentives) that allows the COP to run effectively and efficiently.

##### **IV.2.3.3 Collaborative Physical Workspaces (CPW)**

Collaborative Physical Workspaces are highly likely to be introduced at TPPI. Collaboration initiatives, such as HR for non-HR, Procurement for non-Procurement, Engineers for non-Engineers, and so on, are a simple example. TPPI has two corporate addresses: the head office in Jakarta and a site office in Tuban, which can be used in a more specialized application setting. The two corporate sites allow employees to collaborate both within and across divisions. For example, the procurement department is divided into two sections in Jakarta and Tuban. The two divisions share inseparable roles and obligations in the execution of operational tenders. To reduce the discrepancy and flexibility of employee competency, collaborative physical workplaces can be carried out with formal assignments for a set period of time for Jakarta workers on duty in Tuban or vice versa. With an example like this, all procurement personnel can have the same exposure, enhance competence and skill, and allow for extra compensation for the duty incentives.



IV.2.3.4 Mentor/Mentee Scheme

Mentoring, coaching, and tutoring programs already exist at TPPI, but their implementation is inefficient, non-standardized, and primarily exists for the sake of status. According to the findings of the interviews, there used to be an FRP (Forum Replacement Plan) in place to help with the replacement of individuals who retired and held certain position. This program can be restarted and even expanded (not only to replace retiring workers, but also to prepare cadres for future strategic positions). Superiors and management can select the best applicant from a pool of candidates using the mentor/mentee program.

IV.3 Implementation Plan & Justification

Researchers attempt to integrate business solutions using interview analysis and KM methods and tools into scheduled programs in a one-year implementation plan beginning in middle of 2023 to 2024. It should be noted that the programs prepared are based on analysis and ideas from interviews, therefore approval can be justified indirectly at the individual keyperson level. Furthermore, the compilation and analysis of these concepts will be returned to the keyperson level, and the appropriate departments and top management will conduct a complete and in-depth examination. In practice, it may be done in stages or as a trial project first. Related to the cost of events, there's no additional budgetary prepared for the implementation plans. The cost is burden to the existing budgetary structured. It is not enough to simply install this business solutions; it must also be monitored and reviewed on a regular basis by the project leader or the department designated as the supervisory board. At the end of 2024, the KM readiness level may be remeasured to maintain the gaps.

Table IV.18 Timeline of Implementation Plans in TPPI (Sources: Author, 2023)

Table with 15 columns: POAC Code, No, Activity, PIC, and months for 2023 (Aug-Dec) and 2024 (Jan-Dec). Rows include Planning (1-8), Organizing (9-18), Actuating (19-24), and Controlling (25).

V. CONCLUSION AND RECOMMENDATION

In this final chapter, the researcher tries to wrap up the results of the study through a conclusion and further recommendations. The researcher believes that the results of the study and its application will have a significant and positive impact on the company and its individuals.

V.1 Conclusion

1. The KM readiness level was spot on 131 which categorized "Introduction (Expansion)" with the involvement of 16.67% of the total number of TPPI employees. This result means that TPPI is practices KM in some areas which is wide KM implementation. This result includes a 90% confidence level and a 10% margin of error.

2. The KM categories; Process, People, and Learning & Innovation had equal average score of 17; Knowledge Process and KM Outcomes had equal average score of 18; Leadership and Technology had equal average score of 22. The sequence of prioritization in KM categories based on AHP method result is; 1)

Learning and Innovation; 2) People; 3) Process; 4) Knowledge Process; 5) KM Outcomes; 6) Leadership; 7) Technology. This result achieved with the involvement of 13.03% of the total number of TPPI employees which includes a 90% confidence level and a 10% margin of error.

3. The researcher tends to focus the study of business solutions and implementation plans into the two lowest KM categories based on the prioritization result. The qualitative data input method is gotten through narrative and semi-structured interviews, in which seven VPs participated out of ten. Through qualitative analysis, which is the combination of interview results (OFIs) and KM methods and tools, researchers are able to develop 7 business solutions that are transformed into 15 implementation plans. The implementation plans are scheduled to take place in August 2023 to December 2024.

## **V.2 Recommendation**

1. The KM readiness level result represented 16.67% of the total population, which may need an increase in confidence level and a reduced margin of error through the involvement of a larger population.

2. The prioritization sequence result using AHP method represented 13,03% of total population, which may need an increase in confidence level and a reduced margin of error through the involvement of a larger population.

3. The workload of the VPs as keypersons became an impediment to holding interviews. More number of interviewees may be done to gather information that can be extracted in the future to gain more full insights and ideas.

4. Even though the focus on reducing the gap is on the two KM categories with the lowest scores, more research can be done on how to reduce the gaps in other KM categories. The researcher believes that by focusing on the two KM categories with the largest gaps, it can also improve the gaps in other KM categories. As a result, by the end of 2024, the KM readiness level may be remeasured in order to preserve the changes in overall gaps.

5. The overall results of this study require a lot of input and are far from perfect, but it can be used as a preliminary study for the establishment of an explicit KM development framework at TPPI, beginning with the preparation stage for KM implementation, identifying KM contexts, building KM habitats, implementing KM, and evaluating KM.

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