PROPOSED IMPROVEMENT OF KNOWLEDGE MANAGEMENT IN PT XYZ WITH KNOWLEDGE MANAGEMENT MATURITY METHOD

Naufal Liandi Baskara[1], Amelia Kurniawati[2], Nurdinintya Athari[3]

[1,2,3] Telkom University, Bandung
**naufallb@students.telkomuniversity.ac.id[1], ameliakurniawati@telkomuniversity.ac.id[2],
nurdinintya@telkomuniversity.ac.id[3]**

Abstract

PT XYZ a manufacturing company has implemented knowledge management to some extent. During 2018 the company lost about 400 employees due to mass resignation and recruited 200 new employees. These events cause some concerns to PT XYZ. To be able to compete in the market the company wanted to know the level of their current knowledge maturity level and what program can the company do to improve it. An assessment must be made to answer the formulated problem. This research use the APO-KM assessment tools to measure the company knowledge maturity level and to develop KM implementation program. The level of maturity will determine the KM Objective to improve its level which leads to choosing which KM Initiatives to take. KM pilot program plan will be developed based on the KM Initiatives that were taken. This study found that KM maturity level in PT XYZ is at refinement level. To improve its knowledge maturity level, several factors need to be improved are: (1) Support from top management; (2) Organized system for better managing crisis situation; (3) Small team performance; (4) IT infrastructure. This study proposed programs such as (1) Knowledge café and Community of Practice implemented with storytelling; (2) Creation of Collaborative Virtual Workspace; (3) Implementation of VOIP in knowledge portal.

Keywords: APO-KM assessment tools, Initiatives program, Knowledge management, Maturity level

1. Introduction

Company are realizing that Knowledge Management (KM) is essential to remain agile and compete in a dynamic business environment and increasingly investing in KM initiative. Even though KM have been widely recognize by corporation only a few capable of leveraging and managing knowledge management [1]. Knowledge management involves people, process, and technology necessary to capture, manage, and find information.

In this new millennium, PT XYZ's business activities have expanded to include general trading, construction services, agribusiness, coal mining, oil & gas and telecommunications; while continuing to develop manufacturing fields that have been started since the 50s such as steel pipes, building materials and automotive components. To support PT XYZ's wide business field the company need employees with good competency in various fields.

During 2018 a massive loss of employee with a total of 464 employees of PT XYZ and subsidiaries units resigned and as many as 238 people joined as new employees in 2018. PT XYZ have to ensures that the turnover rate cause by the loss of employees will not interfere with the company's operations and PT XYZ believes that the Company still has employees who have good competence and capability and are highly dedicated.

PT XYZ employee competency is defined as the ability of employees to carry out certain skill that is in the form of tacit knowledge and processed into explicit knowledge to be maintained by the company using knowledge management. Knowledge management in PT XYZ's framework is a part of strategic management with a goal to achieve the corporate objective of 1 to 5 years ahead. Currently the PT XYZ have their own stages in term of knowledge management.

The first stage is knowledge mapping, PT XYZ initiate researches to find what knowledge is needed and to be prioritized for the company. The second stage is knowledge identify, PT XYZ identify the gap between important knowledge that is needed and the current knowledge the company possesses. The third stage is knowledge clustering, PT XYZ collected the knowledge based on the group of the business for example knowledge for the manufacture of electric buses,

pipes or the like are grouped according to the relevant business group knowledge.

PT XYZ involves its employee or the people of the company to take part in knowledge management activities. PT XYZ have developed knowledge portal technology to assist employee could learn about knowledge stored in the e-learning site. PT XYZ also have a division that is tasked with the process of knowledge creation and application. Division X are responsible for planning, creating, and implementing the KM initiative in PT XYZ.

In 2019 PT XYZ had an annual meeting convention with the other subsidiary company. During the convention PT XYZ announced the new problem currently XYZ group are facing. The era of disruptive economics based on the acceleration of scientific development marks the passing of the knowledge-based economy. This means that knowledge is the most important resource for creating competitive advantage [2].

With the entry of the disruptive era that has had a significant effect on the sales market and related activities, many long-established companies unable to adapt to the rapid development of technology are facing the verge of bankruptcy. For a company to survive in the disruptive era of competition, the company must have the ability to adapt to the rapidly growing state of technology & society.

PT XYZ realize in order for the company to compete in the new market with the addition of the loss of employee at huge number in the previous years and possibility of knowledge lost from employee that retired in the following years the current knowledge management system inside the company must be improved.

Knowledge Maturity Model provides an objective assessment of the current level of KM activities in an organization. It provides valuable information on the suitable actions the organization should take for reaching the next maturity level in terms of knowledge management development. When an organization wants to understand the level of maturity of its KM practices. The model should be used after the organization does a KM assessment. The APO KM Assessment tool can be used for this purpose.

The aim of the APO framework is to provide common knowledge among Asian countries and emphasize the value of knowledge management for the success of an organization [3].

2. Research Method

This research used APO-KM assessment tools as the method to measure the maturity of knowledge management in PT XYZ with the data obtained from the employee that have worked in PT XYZ for a minimum of 1 year and given authorization by the company to take the assessment. Knowledge management maturity level based on questionnaire results APO-KM assessment tools are measured based on 7 key categories. The keys category are leadership, process, people, technology, knowledge processes, learning and innovation and knowledge outcomes.

The result of the 7 keys categories will determine the current maturity level that the company has and the KM Objective which will lead into finding the appropriate KM initiative as a solution to its objective. Implementation planning is a process to plan a pilot program for KM initiative to be implemented in the company with the goal to increase the level of the current level of knowledge maturity of the company.

APO questionnaire consisted of 42 question in total. The questionnaire divided into 7 category that represent critical success factors with 6 question for each category. The questionnaire scored with a number between 5 the highest score and 1 for the lowest score as shown in Table-1, and with the highest grand total score of 210.

Table 1 APO-KM Scale

Description	Scale
Doing Very Poorly or None at All	1
Doing poorly	2
Doing Adequately	3
Doing Good	4
Doing Very Good	5

The result of the APO assessment is classified into 5 levels of knowledge maturity: Maturity, Refinement, Introduction, and reaction. Young [4] stated that the result of APO KM maturity assessment provide an understanding of

the level of KM readiness in an organization. The classification is based on the total score obtained from the assessment. The result of the assessment is presented in table of questionnaire group scores and radar charts as shown in Figure-1
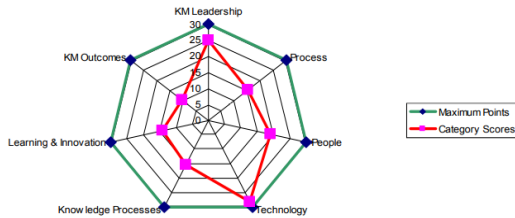

Figure 1 Radar Chart *[5]*

Figure-1 shown the actual scores obtained for each of the categories compared with the maximum obtainable score of the categories. The values contained in the graph indicate the category is in need of improvement. The total value of each categories is then compared with the maturity level score range. The lowest KM maturity level is Reaction within the range of 42 – 83. The highest level is Maturity with the range of 189 – 210 as shown in Figure-2
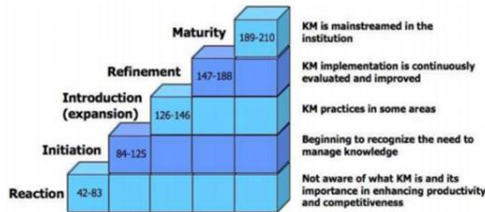

Figure 2 Maturity Level

Figure-2 explains that assessment criteria can be seen based on the comparison of the level of awareness of respondents to the importance of management knowledge for the organization. The results of the assessment provide an understanding of the level readiness of knowledge management in an organization. This can range from the level of "reaction" at the lowest level and to the highest level of "maturity". The conditions that describe KM maturity levels are actually related to the presence, absence, or weakness of the four knowledge management accelerators, learning and innovation, and the results of organizational knowledge management activities [5].

The level of knowledge maturity in the company is then analyzed for its lowest question score of each categories to obtain the factor that slow down improvement of KM. KM Objective is then acquired by providing solution to the slowing down factors. KM Initiatives is then planned to fulfill KM Objective goals. KM Initiatives that formulated will be chosen to suit best KM Objectives. APO provides several KM Initiatives that could increase the level of maturity.

3. Result and Evaluation

The APO assessment conducted at PT XYZ returned with 84 valid responses. The result of the assessment provided in Table-2 is shown that the majority of the respondent scored between the ranges of the level of Refinement.

Table 2 Research Data Based on Total Score of Respondent

Level	Score	Percentage (n=84)
Maturity	189-210	3,5%
Refinement	147-188	79,8%
Expansion	126-146	15,5%
Initiation	84-125	1,2%
Reaction	42-83	0%
Total		100%

Division X is the division that managed activities involving knowledge of the company such as creation and distribution of knowledge. Table-3 shown that Division X scored the level of Refinement while the majority of the others division also scored at the level of refinement a quarter of the respondent scored at different level. It means that knowledge of the company was not distributed between divisions equally like division X intended to.

Table 3 Research Data Based on Division

Level	Score	Division	
		X (n=19)	Others (n=65)
Maturity	189-210	0%	4,6%
Refinement	147-188	100%	74%
Expansion	126-146	0%	20%
Initiation	84-125	0%	1,5%

Reaction	42-83	0%	0%
Total		100%	100%

APO KM Framework analyze the score of each questions category in a form of radar chart. To be able to generate a radar chart the data must be obtained by acquiring the average score of each question categories. The average score is obtained by calculating the 7 categories average score of 84 respondents.

Table 4 Category Average Score

No	Category	Average	Max Score	Rank
1	KM Leadership	22,33	30	6
2	Process	22,90	30	2
3	People	23,21	30	1
4	Technology	22,18	30	7
5	Knowledge Process	22,75	30	3
6	Learning & Innovation	22,61	30	5
7	Knowledge Outcomes	22,67	30	4
	Total	158,65	210	

From The data of the category scores provided in Table-4, radar chart can be created as shown in Figure-3.
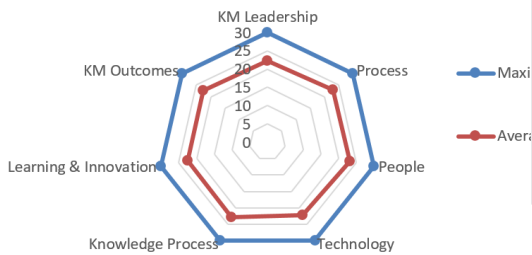

Figure 3 Average Score Radar Chart

Based on the Figure-3 radar graph it can be seen that on category People the score obtained is 23,21 making it the highest score of all the seven category. The score itself could be considered a decent score and it mean that the mechanism between employees to share knowledge or collaboration work is regularly evaluated and improved. The second highest score is Process category with the score of 22,90 out of 30. The process category represent that the company process systematically are getting to be more effective and well deployed.

Knowledge Process placing the third place with a score of 22,75 which describe that the knowledge process regularly reviewed and benchmarked with other organizations for continuous improvement.

KM Outcomes and Learning & Innovation both scoring 22,67 and 22,61 respectively shown that the employees having a good to excellent result of organizational performance also systematically improved and evaluated regularly for learning and innovation purposes.

KM Leadership with score of 22,33 currently the second lowest score shown in the graph represent the top Management regularly reviews organizational performance reinforce organizational direction to improve product/service delivery, and create new products/ service.

Technology category falls to the lowest score of 22,18 out of 30, while the score represent IT infrastructure have been reviewed and its context improved according to the needs of KM strategy. Based on the questionnaire result some percentage of employees outside the X division state that the technology provided by the company are still outdated.

Further explanations on Refinement level based on APO KM Framework Maturity Level interpretation and juxtaposed with the actual survey results taking the highest/lowest score of the questionnaire items are shown below to highlight the significant area:

- **KM Leadership (Score: 22.33; Level: Refinement)**

    APO interpretation   :
      - Management leads the implementation of KM and regularly reviews the company performance.

    Survey Result   :

- Management have promotes, recognizes, and rewards performance improvement in the company.
- The company has shared knowledge, vision, and strategy strongly linked to the company's vision, mission, and goals.
- Respondent claim not enough financial resources are allocated for KM initiatives.
- The company policy for safeguarding knowledge is still lacking.

- **Process (Score: 22.90; Level: Refinement)**

  APO interpretation :
  - Systematic process are improving to be more effective and well deployed.

  Survey Result :
  - The company have regularly evaluate and improve its work processes to achieve better performance and updated with the latest business trends.
  - The company already implements and manages its key work process to ensure customer requirements are met and business result are sustained.
  - Still lack of organized system for managing crisis situations or unforeseen events that ensures uninterrupted operations, preventions, and recovery.

- **People (Score: 22.21; Level: Refinement)**

  APO interpretation :
  - Mechanism for knowledge sharing and collaboration are regularly evaluated for continuous improvement.

  Survey Result :

- The company acknowledge that education, training, and carrier improvement program that is given by the company would contribute to higher performance of the employee.
- The company has a database of employee competencies.
- Employees didn't fully organized into small groups work improvement teams to respond to workplace problems/concerns.
- Company's formal mentoring, coaching, and tutoring processes still not optimal.

- **Technology (Score: 22.18; Level: Refinement)**

  APO interpretation :
  - IT infrastructure is continually reviewed in the context of its alignment to the KM strategy and improved accordingly.

  Survey Result :
  - Every employee granted access to a computer.
  - Every employee had access to Internet/intranet and given an email address.
  - IT infrastructure still not aligned to the organization's KM strategy.
  - IT infrastructure established by management didn't have the capabilities to facilitate effective KM.

- **Knowledge Process (Score: 22.75; Level: Refinement)**

  APO interpretation :
  - Processes are regularly reviewed and benchmarked with other organizations for continuous improvement

  Survey Result :
  - The company had a systematic process to identify, create,

store, share, and apply knowledge.
- Benchmarking activities already conducted inside and outside the company, the results then is used to improve performance and create new knowledge.
- Critical Knowledge from the employee that have left the company are not properly stored.
- Employee claimed that knowledge obtained from completed project is not completely documented.

- **Learning & Innovation (Score: 22.61; Level: Refinement)**

  APO interpretation   :
  - Management tools such as a fact-based, systematic evaluation and improvement and organizational learning including innovation, are regularly utilized

  Survey Result   :
  - The company claim that its employee are ready to try new tools and methods to increase learning and innovation that would benefit the company.
  - The company valued ideas and contribution from their employee and the employee feels empowered by their contribution to the company.
  - Lack of incentives of the individuals to work together and share information.
  - Employee claim that the company is not fully prepared to take risk and consider a mistake as a chance of learning as long as the mistake is not repeated.

- **KM Outcomes (Score: 22.67; Level: Refinement)**

APO interpretation   :
- Good to excellent organizational performance results and sustained trends over time

Survey Result   :
- The company have maintained its growth as a result of higher productivity, increased profitability, and better quality product and services.
- Employee thinks the organization has increased its profitability as a result of productivity, quality, and customer satisfaction is below expectation and could be improved.
- The organization has a history of successfully implementing KM to some extends.
- Employee claim measures are in place for assessing the impact of knowledge contribution and initiatives but not optimized.

The factors that slow down development and improvement maturity level of KM implementation in the company can be identified from the combination of the smallest values in each category found in the results of the questionnaires are:

a) Organized system are not prepared to manage crisis or unforeseen situation.
b) Knowledge sometimes lost because of lack documentation and not properly stored.
c) The company in need of IT infrastructure that could facilitate KM initiatives.
d) Lack of measures to assessing the impact of knowledge distribution and initiative.
e) Top management need to be more active to fulfill their role as leadership in KM activities.

To counter the factors that slow down development and improvement of maturity level, PT XYZ has an opportunity to implement or develop KM by:

a) Gaining support from top management to acquire enough funding required for KM initiative programs.

b) Companies regularly provide corporate culture cultivation consists of the company's vision, mission, and goals.

c) IT infrastructure equalization to all divisions within company with capabilities to facilitate KM.

d) Implement Leader Development Program for the company's top management.

e) Improved small group role as an organized system to manage crisis and unforeseen situation.

To find the proper tools for the PT XYZ KM initiative programs the KM objective is analyzed and identified for the factors that has an opportunity to implement or develop KM. KM Initiatives for PT XYZ are chosen based on which KM Initiatives is design is suitable to fulfill the KM objectives and some consideration to reduce cost and past experience by using existing KM initiatives to be improved.

Tools that would be used are Knowledge Café, Collaborative Virtual Workspace, After Action Review, Community of Practice, and Knowledge Portal. These tools are chosen and would be used based on the current condition of the company's KM program

Table 5 KM Initiative

No	Subject	KM Objective	KM Initiatives
1	Lack of support from top management.	Gain support from top management.	
2	Lack of organized system for managing crisis situations.	Improve organized system for better managing crisis situation.	Knowledge Café, Collaborative Virtual Workspace, After Action Review, Community of Practice and Knowledge Portal.
3	Lack of function of small team roles.	Improve small team performance.	
4	Lack of Knowledge storing history.	Update knowledge storing periodically.	
5	IT infrastructure are outdated	Improve IT infrastructure.	
6	Knowledge distribution and initiative are not properly measured.	Make a measureable assessment of the information dissemination process.	

The proposal from the data that has been collected and analyzed to plan the next KM program were implemented by division X. The proposals that will be tried to implement is to combine several KM initiatives that can be carried out by PT XYZ to increase the company level of maturity and regulated to run within 1 year to be re-evaluated. During the first quarter of the 1 year plan X have to form a small group to create a KM program plan.

The KM program plan will be adjusted based on the KM objective and KM initiative with the goals to increase the maturity level in the company. After creating proposal the program plan have to be presented to the top management of the company and obtained seal of approval as a proof that the top management support the proposal. The implementation of the program will be taken to quarter two through quarter four.

In this proposal the company will implement several activities, namely for division X to review the functions and the objectives of the KM sub-division that have been made previously. Recreate the target of the KM division in the form of KM program that will be implemented in the company. Division X is in charge of improving the performance of top management in the company to become a role model in the division.

The second quarter division X improved the existing KM initiatives while adding the new ones. Supporting technology should also be developed for the latest KM initiatives to support implementation in all divisions and all employees who play a role in the program. In the third quarter, companies can increase the role of communities of practices in KM program development. The KM initiatives will be running during quarters 3 through 4. New knowledge discovered later acquired and stored in the company knowledge portal that currently owned.

5. Conclusion

APO-KM Assessment Tools questionnaire result obtained from PT XYZ employee is valued at 158.65 stating that the company KM is at the level of Refinement with all 7 of the key elements are equally at the Refinement level. Based on the APO-KM Maturity Level it can be concluded that the company's Implementation of KM is continually evaluated for continuous improvement. Improvements proposed with the latest KM initiatives with the goal will be to increase the current level of KM maturity.

KM Initiative that will be implemented are: A) Knowledge café and Community of Practice implemented with storytelling to draws the passion out of audience. It is able to address the logical as well as emotional part of the brain, resulting change in people's mindset and behavior to share and create more knowledge than before. B) Creation of Collaborative Virtual Workspace, currently the company didn't have a proper Collaborative Virtual Workspace. Physical Virtual Workspace on the other hand have been up and running for years. The goal is to create a hybrid collaborative workspace so the employee could adjust themselves to work in Virtual Workspace properly. C) Knowledge Portal implemented with VOIP so the employee can gain more knowledge by interacting with the expert online while still inside company portal
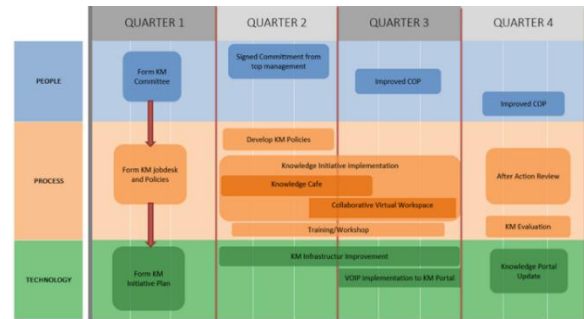

Figure 4 Proposed Program Timeline

Figure-4 shown the timeline of the proposed program from the data that has been collected and analyzed to plan the next KM program were implemented by division X. The proposals that will be tried to implement is to combine several KM initiatives that can be carried out by PT XYZ to increase the company level of maturity and regulated to run within 1 year to be re-evaluated.

Reference

[1] K. Y. Wong and E. Aspinwall, "Knowledge management implementation frameworks: a review.," *Knowledge and Process Management, 11(2),* pp. 93-104, 2004.

[2] I. Brinkley, "The Knowledge Economy.," *How Knowledge is Reshaping the Econnomic life,* 2008.

[3] D. Sensuse and S. Rohjawati, "Knowledge Management: Workshop APO Framework," *International Journal of Computer Science Issues, 10(2),* pp. 25-32, 2013.

[4] R. Young, Knowledge Management Tools and Techniques Manual, Tokyo: Asian Productivity Organization, 2010.

[5] M. G. Djajasoedarma, A. Sukmawati and E. Anggraeni, "ANALISIS PENGELOLAAN PENGETAHUAN DENGAN ASIAN PRODUCTIVITY ORGANIZATION ASSESSMENT TOOLS PADA PERUSAHAAN PERKEBUNNAN INDONESIA," *Jurnal Dokumentasi dan Informasi, 41 (1),* pp. 61-74, 2020.