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Proposed Knowledge Management System to Improve Corporate Digital Learning Development Project in PT X

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ABSTRACT

Digital learning has become one of the effective methods to improve learners' knowledge and skills, especially in the current digital era that is rapidly developing. PT X, as a digital learning solution provider in Indonesia, sees that optimizing production in corporate digital learning development projects is very necessary at this time. The rapidly changing character of digital business, the complexity of the project process, and the large amount of learning material from clients with various backgrounds in industries require a knowledge management approach to improve it. This research begins by assessing the readiness of knowledge management in PT X using Asian Productivity Organization (APO) Knowledge Management Tools and semi-structured interviews. The implementation of knowledge management is presented in a design to form four organizational enablers and KM initiatives complete with their implementation schedules. The APO KM Assessment Tools show that PT X scored low in leadership and people categories, which is supported by the interview analysis revealing a lack of clear KM formulation covering strategy, people, process, and technology. This absence of KM implementation may result in knowledge loss. Insufficient knowledge, skill, and attitude (KSA) for digital learning development projects were also concluded from the interviews, affecting service excellence and client management. Inadequate knowledge management leads to longer project completion times, missed deadlines, and decreased productivity. Therefore, implementing a proper KM system helps effectively manage knowledge assets, leading to increased work productivity and service excellence.

Keywords: Knowledge Management, Digital Learning Development, Organization Enablers, KM Strategy, KM Initiative.

1. Introduction

1.1 Corporate Digital Learning in Indonesia

Training and learning using technology are rapidly evolving along with the industrial revolution. Starting in the 3rd industrial revolution when computers with automation arose, training and learning also began with automation. Many models are introduced, started from CBT (Computer Based Training), IBT (Internet Based Training), e-Learning which is focused on electronic media delivery of materials, then evolves into online Learning which is focused on distance delivery of materials, and the latest model is digital learning which is focused on learning data analytics, collaboration, and personalized learning.

Nowadays, the needs for digital learning and its ecosystem are also rapidly increasing among corporations in Indonesia. The needs can start from digital learning road map, digital learning system implementation, digital learning contents implementation, and the processing of digital learning activities into a comprehensive result.

The implementation of digital learning system and contents that are implemented in corporation are usually divided into two models: 1) Providers that offer SaaS (Software as a Services) model, which is the corporate has a number of licensed that can be used by its employees to access the digital learning ecosystem including the thousands of digital learning contents. This model allows the corporate use the “as is” best practices product that already built by the provider but limited to the custom features of learning system or custom learning contents to suit their specific needs. 2) Providers that offer customization or even bespoke solutions, which is the corporate can request everything they want to fit their needs in their digital learning ecosystems. The most bespoke solutions usually happen in digital learning contents, the corporate needs specific

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learning contents and personalized into their corporate identities.

1.2 Introduction of PT X

PT X is a digital learning service provider which provides complete solution of digital learning start from consultation, road map development & implementation, digital learning contents & system development, and implementation & evaluation.

Founded in 2006, PT X was built with the passion of giving back to Indonesia by making a difference in Indonesia's education system, and has brought a new learning experience to various schools in Indonesia. Sixteen years later, PT X has grown to offer a wide range of learning solutions nationwide. Its reach has expanded to a number of government agencies and private organizations as well, winning national awards along the way. Now serving over 5 million learners from diverse social backgrounds, PT X has been recognized internationally as the leading bespoke digital learning developer in Indonesia.

1.3 Business Issues

Because the core services of PT X are bespoke, the development process start from project kick off until final delivery is very dynamics, moreover, the project also involves clients as SMEs in the model of joint development. The project scope and time are fluctuate based on many factors that needs to be overcome, and this is resulting the cost of development becomes high. The delay in completing the projects has resulted in revenue losses and increased costs, leading to a decline in the net profit margin percentage. The low productivity and service excellence have hampered the progress of the projects, causing delays and disruptions in the workflow. As a result, PT X has been unable to deliver projects on time and within budget, leading to a decrease in profitability.

Table 1. Data of projects delay by total projects

Year	Total Projects	Total Projects Delay	Percentage of Projects Delay
2019	39	14	36%
2020	28	11	39%
2021	47	23	49%

Source: Data processed (2023)

Table 2. Data of projects delay by e-learning hours (elh)

Year	Total Projects (elh)	Total Projects Delay (elh)	Percentage of Projects Delay (elh)
2019	158 hours	76 hours	48%
2020	122 hours	45 hours	37%
2021	187 hours	125 hours	67%

Source: Data processed (2023)

Table 3. Data of average month of projects delay

Year	Average Month of Projects Delay
2019	3.2
2020	2.9
2021	4.1

Source: Data processed (2023)

1.4 Research Questions and Objectives

The research questions of this research are:

1. How can knowledge management eliminate project delay and simultaneously increase work productivity and service excellence of digital learning development projects?
2. What is the best way to implement a knowledge management system for optimizing and reducing the cost of digital learning development projects?

The research objectives of this research are:

1. To eliminate the delay of digital learning development projects in PT X.
2. To increase work productivity and service excellence of digital learning development projects in PT X.

2. Literature Review

2.1 Knowledge Management

According to Zack (1999), "Knowledge management is the process of capturing, distributing, and effectively using knowledge." While according to Davenport and Prusak (1998), "Knowledge management is a set of practices aimed at discovering and harnessing an organization's intellectual resources, such as expertise, skills, and experience, to improve performance and create value."

2.2 Data, Information, and Knowledge

According to Tjakraatmadja (2021), "Data is facts and figure relay something specific, but not organized in any way", and "Information is contextualized, categorized, calculated and condensed data", while "Knowledge is know-how, understanding, insight, and contextualized information."

2.3 Explicit Knowledge

According to Tjakraatmadja & Krisnawati (2017), "Explicit knowledge is a knowledge that has been documented such as article, visual audio, and database." In the case of PT X's digital learning development project, explicit knowledge can be project management SOP, digital learning development project SOP, and clients' raw materials of learning in the form of text (pdf, ppt, doc, xls), audio or video.

2.4 Tacit Knowledge

According to Tjakraatmadja & Krisnawati (2017), "Tacit knowledge is a knowledge which has not yet documented, articulated, or codified." In the case of PT X's digital learning development project, tacit knowledge can be the knowledge that are obtained from clients through interview in transfer knowledge session, project communication through call, experiences of knowing the type of subject matter experts (SME), and experiences of company culture and characteristics in conducting digital learning project joint-development.

2.5 Knowledge Management Framework

Jaan Models Knowledge Management Framework is a house of knowledge driven organization as a framework in creating smart organization (Tjakraatmadja, 2021).

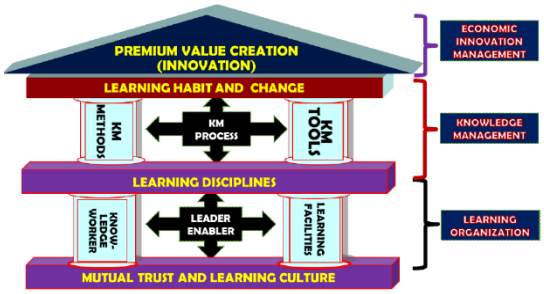

Figure 1. Jaan Models Knowledge Management Framework
(Source: Tjakraatmadja, 2021)

This framework consists of two levels building which are house of learning organization as the first level and house of knowledge management as the second level. As a foundation base, the house of learning organization, consist of:

a. Mutual trust and learning culture as the foundation to create positive environment of learning in the organization.
b. The first pillar: Knowledge Worker is the capabilities of human capital in capturing the learning processes and knowledge.
c. The second pillar: Learning Facilities is the capabilities of facilities to boost the speed of learning especially in this digital era.
d. Learning disciplines as the roof to ensure the learning process running well.
e. Leader enabler is an enabler or influencer by the leaders that runs all of other components in good learning environment.

The good learning organization becomes foundation of knowledge management of the organization, the house of learning organization is the foundation of the house of knowledge management to create learning habit and change and becomes a premium value creation (innovation)

2.6 APO KM Assessment Tools.

The Asian Productivity Organization (APO) is an intergovernmental organization committed to improving productivity in the Asia Pacific region. Established in 1961, the APO contributes to the sustainable socioeconomic development of the region through policy advisory services, acting as a think tank, and undertaking smart initiatives in the industry, agriculture, service, and public sectors.

According to the website: "APO KM assessment is a survey questionnaire designed to help organizations conduct a rapid initial assessment of their readiness for KM. The assessment is carried out at the beginning of the KM program. Before starting on the KM journey, it is important for the organization to know its strengths and opportunities for improvement. The organization can then focus on its KM programs to address the gaps identified through the assessment."

APO KM Assessment Tool has seven audit categories based on the key elements of the Framework, they are KM Leadership, Process, People Technology, Knowledge Processes, Learning and Innovation, and KM Outcomes. There are a total of 42 questions covering the seven audit categories, with a maximum score of 210 points. Each category has a maximum score of 30 points. Each of the questions can be rated from 1 (doing poorly or nothing at all) to 5 (doing very well). The average score for each category is then tabulated and presented in the form of a radar chart below.

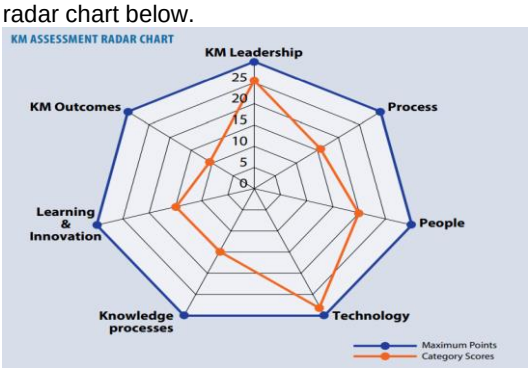

Figure 2. APO KM Assessment Radar Chart

The total score of the assessment is then compared against the KM Maturity model below.

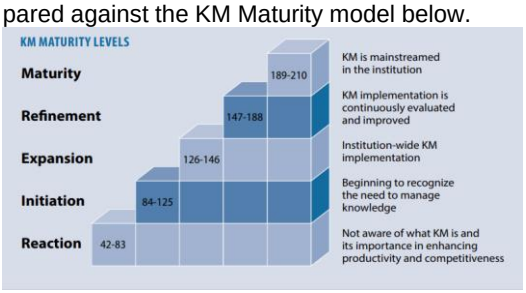

Figure 3. APO KM Maturity Levels

3. Research Method

3.1 Research Design

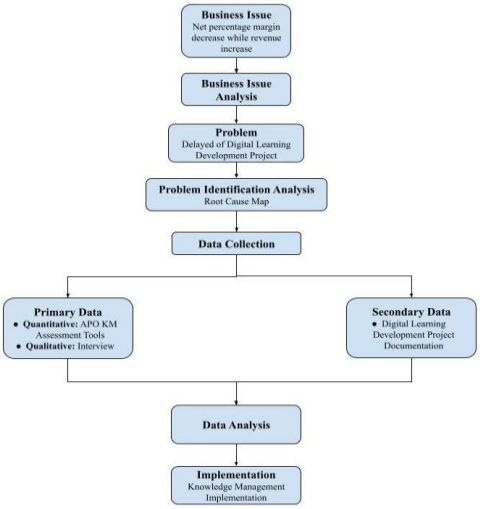

Figure 4. Research Design

The research design starts from the business issue, which is the decrease of net percentage margin while revenue increases. Based on observation analysis, the problem leads to the delayed of digital learning development projects. Ninety percents revenue of PT X are generated from digital learning development projects, the cost of projects is the highest, and significantly higher among other costs. Because most of PT X's business is in services, the cost of employees renumerations is significantly higher among other costs.

Based on the problem identification using root cause map, the root cause of delayed project is lack of knowledge management process in the company. The implementation of knowledge management is also important because the core business of PT X is in learning area. Lots of materials are processed in the digital learning development projects to produce the good digital learning products. In this case, knowledge management system is never implemented before in PT X. The implementation of knowledge management system can create a great impact of the digital learning development projects.

3.2 Quantitative Data Collection Methods

Data collection methods of this research is using quantitative and qualitative methods. In the quantitative method, the KM Readiness of PT X is being assessed using APO KM Readiness Assessment Tools. The initial state of KM Readiness of PT X will be obtained, and the result will be used as a starting point for the next steps. In this APO KM Readiness Assessment Tools, there are a total of 42 questions covering the seven audit categories, with a maximum score of 210 points. Each category has a maximum score of 30 points. Each of the questions can be rated from 1 (doing poorly or nothing at all) to 5 (doing very well). The assessment questionnaire should be answered by 70–80% of employees in the organization at all levels and all departments. Respondents should have been employed by the organization for at least six months. This is to ensure that respondents are familiar enough with the organization to be able to answer most of the questions in the questionnaire.

The rating scales of all questions are described below.

Table 4. Rating scale of APO KM Readiness Assessment Tools.

Descriptor	Rating Scale
Doing very well	5
Doing well	4
Doing adequately	3
Doing poorly	2
Doing very poorly or nothing at all	1

Source: www.apo-tokyo.org

The 42 questions are divided into seven categories with maximum points of 30 for each category as described below.

Table 5. Categories of APO KM Readiness Assessment Tools.

Cat.	Category Scores		Max Points
1.0	Leadership	Questions number 1 to 6	30
2.0	Process	Questions number 7 to 12	30
3.0	People	Questions number 13 to 18	30
4.0	Technology	Questions number 19 to 24	30
5.0	Knowledge Processes	Questions number 25 to 30	30
6.0	Learning & Innovation	Questions number 31 to 36	30
7.0	KM Outcomes	Questions number 37 to 42	30
Total Scores			**210**

Source: www.apo-tokyo.org

The Questionnaires of APO KM Readiness Assessment Tools are described below.

Table 6. APO KM Readiness Assessment Tools Category 1.0 Leadership Questionnaires.

No	Category 1.0 Leadership	Points
1	The organization has a shared Knowledge Vision and Strategy strongly linked to the organization's vision, mission, and goals.	
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).	
3	Financial resources are allocated for KM initiatives.	
4	The organization has a policy for safeguarding knowledge (i.e., copyrights, patents, KM, and knowledge security policy).	
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.	
6	Management promotes, recognizes, and rewards performance improvement, organizational and employee learning, sharing of knowledge, and knowledge creation and innovation.	
Sub Total Category 1.0 Leadership		

Source: www.apo-tokyo.org

Table 7. APO KM Readiness Assessment Tools Category 2.0 Processes Questionnaires.

No	Category 2.0 Processes	Points
7	The organization determines its core competencies (strategically important capabilities that provide a competitive advantage) and aligns it to their mission and strategic goals.	
8	The organization designs its work systems and key processes to	

	create value to customers and achieve performance excellence.
9	New technology, knowledge shared in the organization, flexibility, efficiency, and effectiveness are factored into the design of processes.
10	The organization has an organized system for managing crisis situations or unforeseen events that ensures uninterrupted operations, prevention, and recovery.
11	The organization implements and manages its key work processes to ensure that customer requirements are met and business results are sustained.
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.
Sub Total Category 2.0 Processes	

Source: www.apo-tokyo.org

Table 8. APO KM Readiness Assessment Tools Category 3.0 People Questionnaires.

No	Category 3.0 People	Points
13	The organization's education, training, and career development program build employee knowledge, skills, and capabilities, support achievement of overall objectives, and contribute to high performance.	
14	The organization has a systematic induction process for new staff that includes familiarity with KM and its benefits, the KM system, and tools.	
15	The organization has formal mentoring, coaching, and tutoring processes.	
16	The organization has a database of staff competencies.	
17	Knowledge sharing and collaboration are actively encouraged and rewarded/corrected.	
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.	
Sub Total Category 3.0 People		

Source: www.apo-tokyo.org

Table 9. APO KM Readiness Assessment Tools Category 4.0 Technology Questionnaires.

No	Category 4.0 Technology	Points
19	Management has established an IT infrastructure (i.e., Internet, intranet, and website) and has developed capabilities to facilitate effective KM.	
20	The IT infrastructure is aligned with the organization's KM strategy.	
21	Everyone has access to a computer.	
22	Everyone has access to the Internet/intranet and an email address.	
23	Information delivered on the website/intranet is updated on a regular basis.	
24	Intranet (or similar network) is used as a major source of organization-wide communication to support knowledge transfer or information sharing.	
Sub Total Category 4.0 Technology		

Source: www.apo-tokyo.org

Table 10. APO KM Readiness Assessment Tools Category 5.0 Knowledge Process Questionnaires.

No	Category 5.0 Knowledge Process	Points
25	The organization has systematic processes for identifying, creating, storing, sharing, and applying knowledge.	
26	The organization maintains a knowledge inventory that identifies and locates knowledge assets or resources throughout the organization.	
27	Knowledge accrued from completed tasks or projects are documented and shared.	
28	Critical knowledge from employees leaving the organization is retained.	
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.	
30	Benchmarking activities are conducted inside and outside the organization, the results of which are used to improve organizational performance and create new knowledge.	
Sub Total Category 5.0 Knowledge Process		

Source: www.apo-tokyo.org

Table 11. APO KM Readiness Assessment Tools Category 6.0 Learning and Innovation Questionnaires.

No	Category 6.0 Learning and Innovation	Points
31	The organization articulates and continually reinforces the values of learning and innovation.	
32	The organization regards risk taking or committing mistakes as learning opportunities, so long as they are not performed repeatedly.	
33	Cross-functional teams are organized to tackle problems/concerns that cut across the different units in the organization.	
33	People feel empowered and that their ideas and contributions are generally valued by the organization.	
34	Management is willing to try new tools and methods.	
35	Individuals are given incentives to work together and share information.	
Sub Total Category 6.0 Learning and Innovation		

Source: www.apo-tokyo.org

Table 12. APO KM Readiness Assessment Tools Category 7.0 Outcomes Questionnaires.

No	Category 7.0 KM Outcomes	Points
37	The organization has a history (and maintains measures) of successfully implementing KM and other change initiatives.	
38	Measures are in place for assessing the impact of knowledge contributions and initiatives.	
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.	
40	The organization has increased its profitability as a result of productivity, quality, and customer satisfaction improvements.	
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.	
42	The organization has sustained growth as a result of higher productivity, increased profitability, and better-quality product and services.	
Sub Total Category 7.0 KM Outcomes		

Source: www.apo-tokyo.org

The number of respondents in this quantitative survey using APO KM Readiness Assessment Tools is all PT X's employees that employed more than 6 months, which is 38 peoples.

Table 13. List PT X's employees based on job roles.

Job roles	Number of employee(s)
Top Management	2
HR & GA	2
Finance & Accounting	2
Business & Sales	2
Training & Consulting Division	2
Digital Learning System Development Division	9
Digital Learning Content Development Division	15
Digital Learning Project Management Division	4
Total Number of Employees	**38**

Source: Data processed (2023)

3.3 Qualitative Data Collection Methods

For the qualitative method, semi-structured interview is used to get more deep information following the result of KM Readiness of PT X. Critical knowledges and knowledges gap analysis are also gathered during these interviews. The number of respondents which are chosen in semi-structured interview are five people, they are the division heads level in the production and head of project management. Semi-structured interview is conducted to get more deep information and knowledge among the respondents that represents all functions in PT X which are correlated to digital learning development project. The interview will be held to discuss the results of the KM Readiness Assessment, which was compiled from responses of 38 participants. The discussion will also aim to identify critical knowledges and any knowledge gaps in the process of developing digital learning.

The predetermined open-ended questions to guide the semi-structured interview are listed below:

Table 14. List of Interview Questions.

No	Predetermined question	Purpose
1	Do you think that knowledge management is implemented in PT X?	To gain initial understanding about KM in PT X.
2	Is there a culture or habit within your team that may not be realized, but is actually part of knowledge management?	To gain leaderships roles in building KM culture. (Cat 1.0. Leadership)
3	Is there any direction from your management or leader, or perhaps yourself as a leader, both formally and informally, to manage knowledge?	To gain the organization roles in building KM in the company. (Cat 2.0. Processes)
4	Is there any direction or program from your management or leader, or perhaps yourself as a leader, both formally and informally, to improve team capabilities, such as training, knowledge sharing, knowledge repository, project discussions?	To gain KM roles in the company in building people's capabilities. (Cat 3.0. People)
5	Does the use of technology in PT X, both infrastructures and software currently support the implementation of knowledge management?	To gain technology capabilities in the company to support KM. (Cat 4.0. Technology)
6	Would you say that the knowledge within your team is being managed well?	To gain the level of knowledge processes in the company. (Cat 5.0. Knowledge Process)
7	Is there a willingness within your team to learn, develop, and innovate new things?	To gain the level of learning and innovation in the company. (Cat 6.0. Learning and Innovation)
8	In your opinion, does the knowledge management process you mentioned earlier affect team performance in completing projects?	To gain the level of KM outcomes in the company. (Cat 7.0. KM Outcomes)
9	What are the common obstacles that occur in your team when working	To gain the initial understanding of critical

	on a project?	knowledges and knowledge gap analysis.
10	In your team, what important skills and knowledge are needed for a project to run smoothly?	To gain the critical knowledges that needed.
11	In your opinion, what needs to be improved to achieve these important skills and knowledge?	To gain the knowledge gap analysis.
12	From the categories in the APO KM Readiness Assessment, what is lacking and needs to be developed in PT X?	To summarize the KM situation based on APO seven categories.

Source: Data processed (2023)

4. Results and Discussion

4.1 Validity and Reliability Test

Before analyzing APO KM readiness assessment results, validity test is conducted, below are the result of Pearson Correlation coefficient for each question:

Table 15. List of Validity Test Result.

Category	No	Pearson's Correlation coefficient
1.0. Leadership	1	0.654
	2	0.806
	3	0.779
	4	0.692
	5	0.696
2.0. Processes	6	0.456
	7	0.545
	8	0.781
	9	0.668
	10	0.698
	11	0.797
	12	0.749
3.0. People	13	0.747
	14	0.785
	15	0.635
	16	0.724
	17	0.767
	18	0.662
4.0. Technology	19	0.396
	20	0.380
	21	0.592
	22	0.618
	23	0.400
	24	0.327
	25	0.808
5.0. Knowledge Process	26	0.851
	27	0.784
	28	0.716
	29	0.715
	30	0.716
	31	0.750
	32	0.740
6.0. Learning & Innovation	33	0.704
	34	0.378
	35	0.550
	36	0.671
	37	0.746
	38	0.768
7.0. KM Outcomes	39	0.873
	40	0.837
	41	0.719
	42	0.827

Source: Data processed (2023)

The critical value for Pearson's correlation coefficient for a degree of freedom of 38 and a significance level of 0.05 is 0.312. Since all 42 questions have Pearson's correlation coefficient values greater than 0.312, they can be considered valid. For the result of Cronbach's Alpha, below is the result:

Table 16. List of Reliability Test Result.

Reliability Statistics

Cronbach's Alpha	N of Items
.95	42

Source: Data processed (2023)

The Cronbach's Alpha value is 0.95 and it's considered excellent.

4.2 APO KM Readiness Results

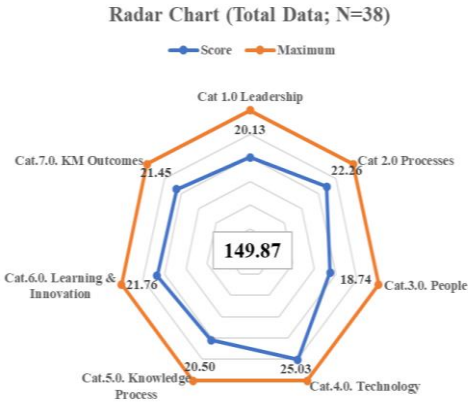

Figure 4. APO KM Readiness Radar Chart Result (Source: Data Processed, 2023)

Based on the APO KM readiness assessment result for the total data, the total score is 149.87, which is at the level of refinement. It means that KM practices are already being implemented on a daily basis at PT X, but there is a need for improvement in externalizing and combining knowledge processes to build a knowledge repository for storing them. Among seven categories, people category is the lowest score with 18.74 and followed by leadership category with 20.13. These categories need attention and improvement for the next KM implementation. For the highest score, technology category is the highest score with 25.03, this represents the industry that PT X run which is IT industry.

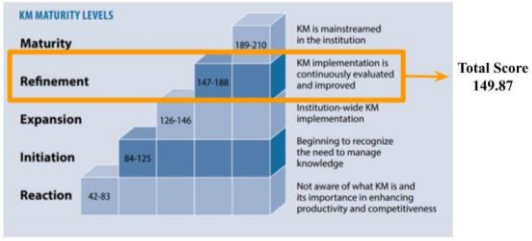

Figure 5. KM Maturity Level of PT X (Source: Data Processed, 2023)

4.3 Thematic Analysis of Semi-Structured Interview

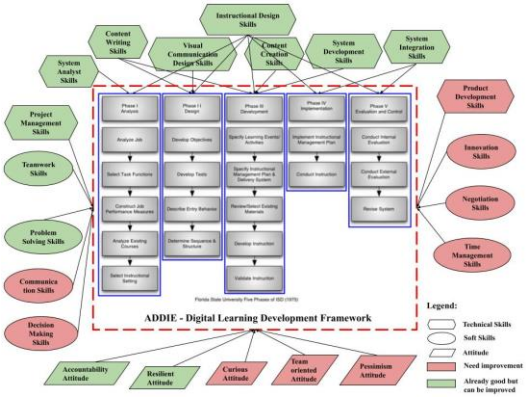

Figure 6. Thematic Analysis Map of Skill and Attitude (Source: Data Processed, 2023)

The skill and attitude map above illustrates the relation between skill and attitude needed and ADDIE, a digital learning development framework used in PT X's project. Specific skills are needed at specific phase of ADDIE, for example content writing skills are needed at phase 2 design and phase 3 development. These specific skills that needed for specific phases are usually technical skills. Soft skills and attitudes, on the other hand, are essential throughout the project timeline, and all team members should acquire them. For the gap, it is indicated that most of them are soft skills, these are the area that need to be focused in KM implementation.

4.4 Business Solutions

The business solutions that proposed are focus in optimizing bespoke digital learning development project for digital learning development teams in PT X through KM implementation. Based on the findings in previous analysis, there are three business objectives:

1. Increasing productivity to reduce the cost of project.
2. Services excellences to manage clients' expectations.
3. Increasing innovation to continuously create new and innovative products and services

4.5 KM Strategy Map

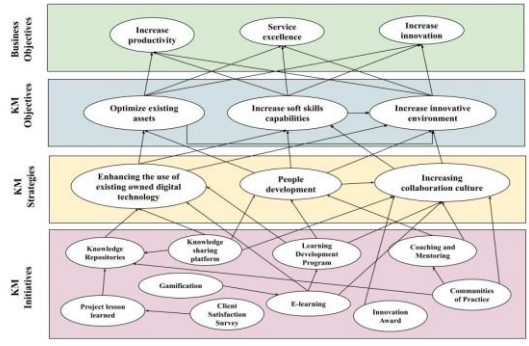

Figure 7. Proposed KM Strategy Map of PT X (Source: Data Processed, 2023)

The KM strategy map above defines the KM objectives, strategies, and initiatives required to achieve business objectives. Three KM strategies that have been defined are enhancing the use of existing owned digital technology, people development, and increasing collaboration culture.

4.6 KM Initiatives

To support the KM strategies outlined, ten KM initiatives have been identified as shown at the table below. These initiatives are designed to help facilitate the development and implementation of the KM strategies, and to ensure that they are effectively integrated into PT X business processes. By implementing these initiatives, PT X can create a more robust and effective KM program that will help to drive business growth and success.

Table 17. Proposed of KM Initiatives List of PT X

No	KM Initiatives	Explanation
1	Knowledge repositories	Knowledge repositories are essentials for PT X to manage learning materials from clients in various industries. It also manages internal knowledges of digital learning development projects.
2	Knowledge sharing platform	It is important to have a platform that employees can share their knowledges, especially for services company that always dynamics and unique in each project.
3	Project lesson learned	Project lesson learned sharing session can be essentials to mitigate the next project, especially for digital learning projects that still new industry and very dynamics.
4	Client satisfaction survey	It is important to capture the client's expectations and the results of PT X's projects, as these can provide valuable insights for improving service excellence.
5	Learning development program	The goal of this initiative is to support the acquisition of knowledge and skills that employees need to be effective in their roles, as well as to encourage a culture of continuous learning. Based on critical knowledges gap, soft skills are the main targets of this KM initiative.
6	E-learning	PT X will optimize the e-learning process for internal use. The company has good capabilities in e-learning implementation since it is an e-learning services company.
7	Gamification	Gamification will increase engagement, better retention, and immediate feedback in learning. PT X has capabilities in building this KM initiative.
8	Coaching and	Coaching and mentoring are an effective way to increase

	mentoring	soft skills capabilities, which are critical knowledge gaps in PT X.
9	Communities of Practices (CoP)	CoP can be established in PT X to facilitate knowledge sharing and collaboration among team members, which can help increase their soft skills capabilities
10	Innovation award	The award will encourage employees to come up with innovative ideas that can help the company to improve its products, services, or processes.

Source: Data processed (2023)

4.7 Proposed KM Implementation Plan

Before conducting KM initiatives, KM implementation should be prepared first in order to optimize the KM initiatives. Below is the KM implementation preparation based on four organization enablers (Tjakraatmadja, 2020):

1. Strategy

1.1. Prepare KM Vision, Mission, and Strategy.

KM vision are set to describe the ultimate goal of the KM initiatives and what the organization hopes to achieve through knowledge management. KM mission are set to provide a clear and concise statement of what the KM program will do and how it will support the organization's goals. It will be focused on the specific goals and objectives of the KM program and will provide guidance for the development of the KM strategy. KM strategy will provide a roadmap for achieving the goals and objectives of the KM program. It will be aligned with the organization's goals and objectives, and it will provide guidance for the development of specific initiatives and activities. PT X will focus on increasing productivity, innovation, and use of technology to enhance soft skills capabilities based on the previous analysis.

1.2. Prepare budget.

Budget preparation will follow the strategy that are set before, the needs of human resources, technology needs both hardware and software, training allocation both e-learning and classicals, third party resources, also transportation and accommodation will be calculated. The budget allocation strategy also calculated based on the delivery's stages.

1.3. Develop KM governance.

These are the guidelines for KM implementation, establishing KM steering committee, defining roles and responsibilities, developing policies and procedures, establishing performance metrics, establishing communication channels and providing training & support for implementation are set.

2. People

2.1. Establish KM Team

KM Team will be established to manage KM governance by appointing existing employees and recruiting additional team members especially for dedicated member. Clear roles and responsibilities will be defined for all team members to ensure effective coordination and implementation of the KM initiative.

2.2. Develop KM Culture

Establishing KM culture is an essential component of successful KM implementation. Socialization and delivery communication of KM to all employees, fostering learning culture, encouraging knowledge sharing, recognizing and reward knowledge sharing, led by example, and integrating KM as part of organizational culture are essentials in this phase.

2.3. Develop KM Training Program

The primary goal of establishing a KM training program is to increase the skills and capabilities of all KM team members, enabling them to effectively implement KM and improve the overall effectiveness of KM initiatives. Through the training program, team members will gain a deeper understanding of KM principles, best practices for knowledge sharing, and proficiency in using KM tools and technologies. This will help to build a strong foundation for the successful implementation of KM initiatives, which will ultimately lead to improved organizational performance and competitive advantage.

3. Processes

3.1. Identify knowledge assets

As a digital learning company, PT X receives vast amounts of knowledge that need to be managed for use in digital learning projects. Identifying knowledge assets is crucial for effectively managing the different types of knowledge acquired both internally and externally. This involves categorizing the knowledge based on its type, value, and accessibility, as well as assessing its quality to ensure its reliability and relevance. Additionally, determining the ownership of the knowledge is necessary to obtain the appropriate permissions for sharing or using it. Finally, prioritizing the knowledge assets based on their strategic importance and potential value to the company enables PT X to effectively manage its knowledge resources and leverage them for successful digital learning initiatives.

3.2. Create KM taxonomy

Creating KM taxonomy involves developing a standardized framework for categorizing knowledge assets, such as documents, data, and expertise, based on their content, context, and purpose. The goal of KM taxonomy is to create a consistent and meaningful way of organizing and managing knowledge assets so that they can be easily accessed and shared within the organization. At PT X, it is important to categorize external knowledge assets from various client industries, such as finance, banking, manufacturing, automotive, and oil and mining. Additionally, internal knowledge assets related to the digital learning development process, which involve cross-functional teams, should also be managed through taxonomy.

3.3. Develop knowledge management process.
At PT X, Instructional Designers are responsible for managing knowledge from clients that will be digitized and are also the main counterparts of clients' Subject Matter Experts in knowledge sharing. To ensure that these materials are properly disseminated to the next divisions, it is essential to develop a knowledge management process.

4. Technology
4.1. Define KM systems that will be used
Defining KM systems is an important because it enables company to identify the technology platforms and tools needed to support KM strategy. KM systems can help company capture, store, organize, and disseminate knowledge effectively, and can include a variety of technologies such as content management systems, collaboration platforms, knowledge portals, and social media tools. At PT X, there are several KM systems that already used such as Learning Management System (LMS) and Knowledge Management System (KMS) using Axellar, one of PT X products, project management system using Asana, and versioning & control management tools using Github. Another system will be defined especially in supporting the KM objectives in increasing soft skills and innovation.

4.2. Configure and integrate KM systems
Configuring KM systems following the formulation KM strategy, people, and process are very important. Technology is just tools without strategy to use it. Setting up roles in the systems (system admin, KM admin, KM facilitators, KM managers, and users), optimizing and structuring the features, and managing users' data are some of configuration activities. It is also important to ensure that the KM systems are integrated with other existing systems in the company. LMS and KMS should be integrated with the HR system to ensure that employee information is synchronized across systems. Project management system should also be integrated with the LMS and KMS to integrate knowledges from projects.

4.3. Develop KM analytics program
Developing KM analytics program is very important to have the measure the effectiveness of the KM initiatives and make data-driven decisions to improve their knowledge management processes. Defining KPI for KM, developing data collection methods, developing analytical methods, developing integrated reports and executives' dashboards, and developing system intelligence for profiling and recommending users are some of these programs.

4.8 KM Implementation Plan Schedule

The KM implementation will be divided into two phases. The first phase will focus on implementing the four organizational enablers of KM, which are strategy, people, process, and technology, to establish a strong foundation for KM. Once the four organizational enablers are established, the second phase will follow with the implementation of various KM initiatives to enhance the knowledge processes within the company.

Table 18. KM Implementation Schedule of Phase One

	Implementation Activities	PIC	Month number							
			1	2	3	4	5	6	7	8
STRATEGY	Prepare KM vision, mission, and strategy.	Leader & management team	■							
	Prepare budget.			■						
	Develop KM governance			■						
PEOPLE	Establish KM Team	Management, development, project, and HR team			■	■				
	Develop KM culture					■	■			
	Develop KM training program						■			
PROCESSES	Identify knowledge assets	KM Team, development team, and project team					■	■		
	Create KM taxonomy							■		
	Develop knowledge management process							■	■	■
TECHNOLOGY	Define KM systems that will be used	KM Team, development, project, and IT team					■			
	Configure KM systems						■	■		
	Develop KM analytics program							■	■	■

Source: Data processed (2023)

5. Conclusion and Reccomendation

Based on the analysis of situations and initiatives in previous chapters, the research questions for this paper can be answered as below:

1. How can knowledge management eliminate project delay and simultaneously increase work productivity and service excellence of digital learning development projects?

The results of the APO Knowledge Management Assessment Tools indicate that PT X scored low in the leadership and people categories. This is also supported by the interview analysis, which revealed that PT X lacks a clear KM formulation that covers the strategy, people, process, and technology. Although knowledge processes are already taking place in some areas, the absence of KM implementation may lead to knowledge loss. Another conclusion drawn from the interviews is knowledge, skill, and attitude (KSA) that needed in digital learning development projects are insufficient. KSA also has role in good service excellences to manage clients as the characteristics of corporate digital learning development projects are joint development with clients. When knowledge is not properly managed, employees may have to spend more time searching for information they need, which can lead to longer project completion times, missed deadlines, and decreased productivity.
Therefore, implementing a proper KM system can help companies to effectively manage their

knowledge assets, which in turn can lead to increased work productivity and services excellence.

2. What is the best way to implement a knowledge management system for optimizing and reducing the cost of digital learning development projects?

For a digital learning development projects, services have a role in completing project. In addition to that situation, digital learning development projects also involving lots of learning materials from clients that comes from various industries. The agility and characteristics of the digital learning development projects that involving multidiscipline knowledges which are learning and education, visual communication design, and digital technology also increases the complexity of the projects among the stakeholders (PT X and clients). These conditions require sufficient soft skills to manage the dynamics of digital learning development projects effectively. This situation was also described in the results of the interview analysis, where soft skills were often mentioned as a keyword in the interview process. While PT X's technical skills were well described enough in the interview process, the critical knowledge gap of soft skills resulted in significant problems in digital learning development projects. Therefore, in the case of PT X, the best approach to implementing a knowledge management system for increasing work productivity and services excellence is to establish the four organization enablers of KM implementation first and focus on enhancing soft skills through KM initiatives.

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