Chapter 14

Establishing Knowledge Management System to Support the Education System

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A. Pandemic Hits Current Educational System

The emergence of the COVID-19 pandemic in late 2019 has disrupted the world's economy and forced many people to restrict many activities. At first, this did not disturb human civilization, as people were still optimistic that this situation would improve soon. However, the pandemic does not yet seem to take any favorable turn as time goes by. Due to the uncertain situation, many sectors finally realized that they had to adapt by changing their activities. Luckily, everything has become more accessible because of current technology development, making this change possible. However, this change cannot be implemented and applied immediately, as it requires many adjustments and

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elaborations to deal with existing problems and limitations, including in the educational sector.

Education can develop a human civilization and create many unprecedented innovations and changes. This fact indicates that education has an essential role in human life, and even though the pandemic has not yet ended, education must still continue as it should be. We already know that the COVID-19 pandemic has disrupted the ideal and effective learning process. This situation will undoubtedly impede education's main purpose, namely creating competitive and knowledgeable human resources. Ma et al. (2016) stated that education could significantly improve human resources' behavior, salary, and quality. However, the COVID-19 pandemic, which has been occurred worldwide, has had a tremendous impact. As reported by WHO data in 2020, COVID-19 has significantly affected 213 countries, with more than 3 million cases worldwide and resulted in more than 200 thousand victims (Kerbl & Zepp, 2021). A report also revealed that the COVID-19 pandemic impeded the learning process in universities and schools. This education sector changed its learning and teaching methods into an online system, and some closed their services, such as the library and labs (UNESCO, 2020). Before the pandemic, online learning received positive feedback and was expected by many people to be the future method of education rather than traditional education (Gaur et al., 2015). Nevertheless, several reports indicated that online learning was not showing a good prospect as expected.

By referring to the Indonesian law no 20-year 2003, we can see that the goal of Indonesian education is developing the student's potency so they can be excellent human, believe in God's greatness, have noble character, healthy, knowledgeable, capable, creative, independent, democratic, and responsible citizens. Based on this goal, we can conclude that the Indonesian education goals are basically align with the global education goals. Global education is affected by pandemics, including in Indonesia, and forced the education sector to embrace changes due to new normal conditions, such as by establishing online learning.

Meanwhile, current Indonesian education usually uses traditional face-to-face learning systems. The COVID-19 pandemic ruined the process even though the Indonesian Ministry of Education and Cultures has already implemented learning portal like "Rumah Belajar" and the others (Permata & Dhoehaeni, 2021). However, universities or schools in Indonesia are forced to face many challenges, especially in finding practical online learning without diminishing students' knowledge acceptance (Zalat et al., 2021). Another challenge with online learning is that the educators seem to find it difficult to properly formulate the teaching method to evoke students' interest and engage their participation, as well as reduce their boredom (Aguilera-Hermida et al., 2021; Aguilera-Hermida, 2020). We commonly see jokes on social media, such as Instagram or TikTok, where a teacher or lecturer explains the course materials. However, the student kept turning off the camera so the educator did not know what the student were doing. This condition is likely due to students' low awareness of learning, or their acceptance that online learning experience is not as attractive as offline.

Additionally, this situation has worsened because the education institution does not have good online learning tools, and Indonesia's infrastructure may be far from ideal. Meanwhile, one of the success factors in online learning is providing appropriate infrastructures, such as adequate internet connection and affordable internet quotas (Salehudin et al., 2021). Besides, the teaching-learning process problem is related to the knowledge management process. By implementing the activity in the knowledge management process, the learning process can be expected to run smoothly.

This chapter discusses how technology, mainly through knowledge management, is essential to improve education and the other basic foundations to implement quality education.

B. Education Challenge in Indonesia

The COVID-19 pandemic gives understanding and the big picture regarding how technology can facilitate education performance in

the future. Several studies discussed this idea, but online education's effectiveness is still widely questionable. The Indonesian Ministry of Education website stated that technology has grown rapidly nowadays. However, it still could not replace the role of teacher, lecturer, and offline learning interaction between educator and student. It happened because, in traditional learning, we refer to obtain knowledge theoretically while learning other values such as teamwork, competition, creativity, and humanity. Therefore, the global pandemic made online learning quite challenging for students and educators (Hendriyanto, 2021; Pengelola Web Kemdikbud, 2021).

From students' perspectives, online learning forced them to become more self-motivated and mature in managing time. While from the educator's perspective, online learning requires them to become more creative to ensure the learning process runs effectively and interestingly, not dull the students. A recent study conducted in Indonesia showed that online learning in Indonesia is usually effective but still inefficient in many ways (Bahasoan et al., 2020). Online learning in Indonesia is inefficient because of the network problem and quota constraints. The study found that the cost of an adequate internet quota may discourage the students, as they need to purchase many top-ups.

Additionally, a good internet provider has not yet covered all areas in Indonesia, making the situation more complicated. For this problem, Indonesian Ministry of Education has given a free internet quota. However, this scheme is not practical because it cannot be used optimally due to the diverse requirement of education methods (Sajida, 2020). This situation is just one example of many challenges Indonesia needs to face.

This section discusses the problem and challenges faced by the education sector in Indonesia.

1. Learning Loss

Based on the international student program assessment report in 2018, Indonesia's ranking was relatively low compared to other countries.

Indonesia ranked ten lowest among 80 countries (OECD, 2019). The phenomenon has seemingly become more urgent because Indonesia's scores in reading, mathematics, and science are declining from 400 to 380 points. In brief, we can conclude that this situation is one of the challenges for the Indonesian education sector, especially during the pandemic situation. The pandemic causes the education process to be conducted at a distance without educators' adequate supervision, thus leading to dangerous learning loss circumstances.

Learning loss can be defined as the decline of students' competence, which can occur due to online learning in a certain period. Preventing learning loss is not easy for educators because their role cannot function as optimally as before due to social distancing policy. Nevertheless, there is a crucial need for supporting roles from parents as people who are close to students, and more importantly, self-motivation from students themselves (Bączek et al., 2021).

The standard solution used by educators is to give students many tasks, and students must complete them. However, we must be aware that many tasks cannot be expected to effectively increase student learning quality, and instead potentially impede the learning process, even though studies show that homework can stimulate student's academic performance. Therefore, it depends on self-motivation (Bembenutty & White, 2013). Quoted from the news report, many students also complain about online learning because they are burdened with more tasks than before. This situation will negatively affect students as they will not enjoy the learning process and perceive that studying is not fun (Galloway et al., 2013).

2. Technology Usage

Online learning cannot be done without the support of technology. Technology act as essential element to smoothen the online learning process. Recently, many learning platforms and applications have appeared a choice to help students and educators allow the learning process to run smoothly. However, the success of online learning is not only determined by how sophisticated the technology itself, but more

by the user's capability to utilize technology optimally. In Indonesia, at least three stakeholders need to properly understand online learning technology: educators, students, and parents (Li, 2007). These three stakeholders hold the key to conduct successful learning process. One of the current challenges is to educating parents and educators born in the 70s or 80s to utilize technology.

On the other hand, this technological challenge is certainly attributed to the unequal economic conditions. We know that Indonesia is a big country, and Indonesia's technology standardization is unequal. It would probably be fine for wealthy people or families in the big city or wealthy because they can afford good internet access and adequate devices. This condition contradicts people or families who live in small-town or unwealthy people because they probably cannot afford good internet access and adequate devices.

3. Learning Culture

It is not a secret that Indonesia has a school culture without an actual learning culture, meaning that we go to school daily, but obtain almost nothing from school. Many factors drive this situation, such as how students are distracted by their mobile phones or sleep, rather than pay attention to the teacher. We can prevent this phenomenon happened by establishing a learning culture. The learning culture focuses on methods that develop fundamental knowledge and allow students to implement it after school.

Learning culture is a series of activities in doing learning tasks. Creating a learning culture needs a long process and can be started by planting the interest to study and making it a natural behavior rather than a forced action. Students with good learning culture will feel like they are violating a norm if they are not studying. Ideally, when students think that studying is fun, they will receive more knowledge and increase inner motivation, thus impacting productivity. In the large picture, learning culture will become the key to determine a society's identity (Jenert, 2011).

4. Another Challenge

Implementing a knowledge management system is difficult, since it can have many challenges. Several studies tried to map the challenges of implementing knowledge management (Mishra, 2012; Petrides & Nguyen, 2006). They argued that even if we plan what we think best, it still would have weaknesses and distract our focus. Due to this reason, we still need to plan to counter it. The following are some other common challenges we might face and need to be tackled properly:

a. Inability to recognize knowledge
b. Geographical distance
c. Limitations of information and communication technologies
d. Loosely defined areas of expertise
e. Constantly changing regulation
f. Internal conflicts
g. Lack of incentives or performance management goals
h. Poor training or mentoring programs
i. Cultural barriers

C. Knowledge Management

Knowledge management is gaining acceptance in education because knowledge is a concept of utilizing the information from many sources and potentially used as learning strategies (Oye & Salleh, 2013). Knowledge management is a set of practices to improve the use and sharing of data and information in decision-making. However, many educational institutions have already acknowledged and used knowledge management to improve their learning system recently. Using knowledge management in the education sector will benefit education stakeholders (Saide & Sheng, 2020). For example, it will give external and internal quality improvement, provide more accessible information gathered by educators and school administrators, and prevent excess information.

Good education needs a good teacher, and a good teacher needed must be made, not found. A good teacher will be assessed by standard

assessment, tests, and certification in the current system. However, these things are not entirely correct because the practical side can differ from their tests and certification. Qualifying in the certification and tests are crucial because educators cannot leave their students like leaving a missing child behind, and educational institutions need to be flexible with time development. At the same time, teachers must remain abreast of a wide variety of changing standards, curricula, and pedagogical methods.

The faculties and universities have a more complex situation because many tasks need to be done by the lecturer. Faculties face increasing information and innovation in their field, and it is difficult to align with these consistently. Moreover, faculties and universities also need to adjust their budget to hire good quality staff, develop the faculty infrastructures, and other things such as conference fees. Additionally, they have to teach a much broader population and determine which teaching methods are most suitable for demographic groups. Moreover, they also need to be more involved and persistent about student assessment issues from college entrance and placement to value-added issues related to the degree.

This section will discuss the knowledge management cycle and how each step will help the education field. A function in knowledge management has four following steps in a cycle. This cycle is created because knowledge will be refined over time. The knowledge in a good knowledge management system (KMS) is never finished because the environment changes over time, and the knowledge must be updated to adapt to the changes. The cycle works as follows:

1. Knowledge Acquisition

Knowledge acquisition is the process of collecting and obtaining knowledge from various sources. Through this process, people can add new knowledge to knowledge basee. When this situation happens, the knowledge will be refined and improved. The acquisition can be defined as expanding the capabilities or improving performance at

a specified task. The goal of this process will focus on creating and refining the current knowledge. In the educational sector, we can use this process to get a source of knowledge from textbooks, technical papers, database reports, journals, and the environments that might be presented as facts, rules, concepts, procedures, heuristics, formulas, relationships, statistics, or any other helpful information. Knowledge acquisition is not a one-time process but can be repeated many times because knowledge will constantly develop.

2. Knowledge Store

Knowledge store uses technology to store structured and unstructured information in the database. This process takes place in the expert system that contains the facts about the world and ways of reasoning related to those facts or highlights the inconsistencies. In the educational sector, the knowledge store can be a place to submit and gather a lot of knowledge or information which may be accessed later by stakeholders in the educational sector.

3. Knowledge Distribution

Knowledge distribution is a process of distributing knowledge to all stakeholders involved in the educational sector. The knowledge can be provided by educators or anyone who wants to distribute their knowledge. Later, this process will ease teachers and lecturers to teach their students, to understand the lesson easily.

4. Knowledge Usage

Knowledge usage is usually used in the business sector to make business decisions or gain opportunities. The educational sector can facilitate students in implementing their knowledge in class. This process is usually recursive and continually generates feedback that improves comprehension and can be integrated into other knowledge activities. For example, educators can monitor this process to evaluate how students apply the knowledge in real life, like during internships or apprenticeships.

5. Type of Knowledge

Generally, in knowledge management, there are two categories of knowledge: explicit knowledge and tacit knowledge. Polanyi (1958) first conceptualized the difference between explicit and tacit knowledge of an organization. Explicit knowledge deals with more objective, rational, and technical knowledge (e.g., data, policies, procedures, software, documents) (Polanyi, 1958). On the other hand, tacit knowledge is usually subjective, cognitive, and empirical learning; it is highly personal and difficult to formalize. Later, Alavi and Leidner (2001) provided a taxonomy of knowledge. They defined a spectrum of different types of knowledge, going beyond the simple binary classification of explicit versus tacit.

Explicit knowledge comprises the policies, procedural guides, white papers, reports, designs, products, strategies, goals, mission, and core competencies of an enterprise and its IT infrastructure. The knowledge has been codified (i.e., documented) in a form that can be distributed to others or transformed into a process or strategy without requiring interpersonal interaction. For example, a description of how to process a job application would be documented in a firm's human resources policy manual. Explicit knowledge has also been called leaky knowledge due to its ease of handling, allowing an individual or an organization to readily and accurately document it.

On the contrary, tacit knowledge is the cumulative store of experiences, mental maps, insights, acumen, expertise, know-how, trade secrets, skillsets, understanding, and learning that an organization has. It also consists of the organizational culture embedded in the past and present experiences of the organization's people, processes, and values. Tacit knowledge, also called embedded knowledge, is usually localized within an individual's brain or in group interactions within a department or branch office. Tacit knowledge typically involves expertise or high skill levels.

Sometimes tacit knowledge could easily be documented but has remained tacit simply because the individual housing the knowledge

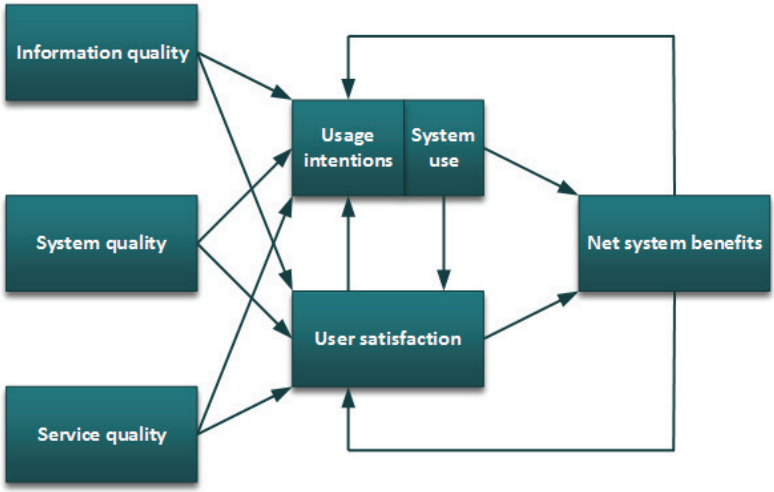
does not recognize its potential value to others. Other times, tacit knowledge is unstructured, without tangible form, and therefore difficult to codify. It is difficult to put some tacit knowledge into words. For example, explaining how to ride a bicycle would be challenging to be documented explicitly and thus categorized as tacit knowledge. Successful transfer or sharing of tacit knowledge usually occurs through associations, internships, apprenticeships, conversations, other means of social and interpersonal interactions, or even simulations. Tacit knowledge also claimed that intangibles such as insights, intuitions, hunches, gut feelings, values, images, metaphors, and analogies are the often-overlooked assets of organizations. Harvesting these intangible assets can be critical to meet a firm's bottom line to achieve its goals. Tacit knowledge sharing requires a particular context or situation to be facilitated because it is less commonly shared under normal circumstances.

D. Information System Success Factor

Creating a knowledge management system cannot be separated from successfully implementing an information system (IS). Delone and McLean explained in their model that information system success could be seen from their information quality, service quality, and system quality (Delone & McLean, 1992; DeLone & McLean, 2016). These three variables will be of why people use technology for a long time to improve performance.

1. Information Quality

Information quality is the quality of the information that the system can store, deliver, or produce. Information quality is one of the most common dimensions to evaluate IS success. In IS concept, the information quality impacts both user's intentions to use the system and user's satisfaction with the system, which, in turn, determines the extent to which the system can yield benefits for the user and organization.



Source: Delone and McLean (2003)

Figure 14.1 IS Success Factor Information Quality

2. System Quality

Along with information quality, the overall quality of a system is also one of the most crucial dimensions commonly evaluated. System quality indirectly impacts how the system can deliver benefits through mediational relationships through the usage intentions and user satisfaction constructs.

3. Service Quality

Along with information quality and system quality, information systems are also commonly evaluated according to the quality of service they can deliver. Service quality directly impacts usage intentions and user satisfaction with the system, affecting the system's net benefits.

4. System Use/Use Intentions

Intentions to use an information system and actual system use are well-established constructs in the information systems literature. The

IS success model has three cores: information quality, system quality, and service quality, affecting system use and intentions. System use is conditioned to influence a user's satisfaction with the information system, which, in turn, affects usage intentions. Along with user satisfaction, system use directly affects the net benefits the system.

5. User Satisfaction

Like actual system use, user satisfaction directly influences the net benefits provided by an information system. Satisfaction refers to the extent to which a user is pleased or contented with the information system and is conditioned to be directly affected by system use.

6. Net Benefits

The net benefit that can be delivered by an information system is a critical facet of the system's overall value to its users or the underlying organization. In the IS success model, net system benefits are affected by system use and user satisfaction with the system. System benefits would influence user satisfaction and a user's intentions to use the system.

E. Recommendation

The pandemic is challenging, but we must find a solution to facilitate education and learning. Previous studies showed that implementing a knowledge management system (KMS) can help people increase productivity and deliver a consistent knowledge asset. Based on these findings, we are eager to utilize the KMS benefit, especially for the educational sector. Implementing KMS requires us to consider many things, such as project management, data mining, blogging, and forum, and without calculating these correctly, we are planning to fail. We need to understand how to adopt KMS to formulate educational objectives and follow the best practices for managing knowledge as an asset before finally disseminating it to students or stakeholders.

1. Investment in Five Cores to Implement KMS for E-Learning

To implement and consider building a proper KMS, we need to develop five cores so the KMS will run smoothly and all stakeholders can benefit from the impact.

a) People

People are the essential core in implementing KMS technology. The technology potency cannot be maximized without a good attitude and skill. To build people, we need to establish the training and class materials to give them insight and prevent the situation where the students/employee gives resistance and bends the school's/organization's rules. The main problem in Indonesia is that we are usually capable of creating good and high-end technology but forget the people element as the actor. It explains why security can be easily hacked because there is a human factor that manipulates and exploits it. In education, there is always a possibility that people will try to disregard the official system and instead find their solution. Shortly, we should prepare the people to build their skills and knowledge to implement the official system comprehensively (Hosseini et al., 2014; Wiig, 2004).

b) Process

The process is the second essential core in implementing the KMS technology. We should understand that the goal of technology is refining the current process and make learning and working more efficient. If we learn how technology transforms everything, we know that technology may replace and transform the traditional system. In other words, when we apply the new technology, we should also change the process and erase unnecessary activity. Shortly, we should prepare the best resources to create the process inside the organization to become more efficient and yield better result than before (Lee & Choi, 2003).

c) Technology

Technology is the third essential core in implementing KMS technology. We should know that we will need the right technology to move

from traditional to advanced. In this part, the organization should understand the current technology and how the technology will be developed in the future (Saide et al., 2018). Choosing the right technology is an easy because we have to analyze the risks and benefits of each technology. For example, there will be great technology with high-price and good features, but the features cannot be used fully. The organization should consider this (Ho, 2009; Lee & Choi, 2003; Saide et al., 2018; Yeh et al., 2006).

d) Structure

The structure is the fourth essential core in implementing the KMS technology. There is a possibility that we need to change the structure. A leader with a good understanding of technology can become a great problem solver. If we cannot find it, the leader can choose the right people with a good understanding of KMS to lead the project (Claver-Cortés et al., 2007; Mahmoudsalehi et al., 2012; Saide et al., 2019).

e) Culture

The culture is the fifth essential core in implementing the KMS technology. Culture has the power to influence the environment in accepting and building good technology conditions in the organization. Some previous studies indicated that people could be changed because an excellent organizational culture influences them. In other words, when we want to rebuild education, we should never forget to give good examples or create conducive culture for the people (Adeinat & Abdulfatah, 2019; Ahmady et al., 2016; al Saifi, 2015).

2. Steps in Building Knowledge Management System for Education

We recommended at least eight steps to help education sector or organization face the challenge, reduce the risks, and maximize the potential rewards. This approach was inspired by ITIL v3 and COBIT approach in IT governance (Choi & Yoo, 2009; Nabiollahi & Sahibuddin, 2008). The following are the steps we recommend:

Step 1: Establish Knowledge Management Program Objectives

Before we enter further steps such as selecting a tool, defining a business process, developing the organization's workflows, and imagining and implementing the ideal end state of KMS, first we should establish the appropriate objectives of KMS itself. In this step, we must identify and document the current business problems. This business problem can become our starting point and business drivers to gain momentum and proper foundation for implementing KMS later. We need to note that the objectives can be short-term and long-term. Both of them should address the business problems and support the business continuity. Short-term objectives should ensure that the program is on the right path, while long-term objectives will help create and communicate the big picture.

Step 2: Preparing Change Management Roadmap

When we talk about knowledge management, we cannot only focus on technology application, as it needs a culture change. Employees and organizations must rethink how they develop, create, and share knowledge. That's the reason why people, processes, and culture are the essential core in implementing KMS. For example, knowledge is not free, and some employees are reluctant to share their knowledge. We can prepare a solution such as giving a reward for their contribution. This practice can form a "knowledge is power" behavior that contradicts a knowledge-sharing, knowledge-driven culture.

When we want to successfully implement a new knowledge management program, the organization may require changes, which can be the organization's norms or shared values. We should understand that every movement or change cannot run smoothly. There will be some people who might resist or even attempt to quash the change. To anticipate and minimize the negative impact, we need to manage cultural change. An example of good solution in the organization is to recruit knowledge-management experts who can encourage knowledge-sharing behaviors within their departments and provide valuable feedback for the implementation team.

Step 3: Formulate and Map the High-Level Process for Starting Point

Mapping out a high-level knowledge management process is vital for effective implementation. Working with a high-level process will help the organization develop and hone detailed procedures throughout the following steps progressively. It should be noted that we need to understand the people who will be the users and contributors of knowledge. This part cannot be skipped and should be part of this process because in developing the KMS, we must include everything and ensure the needs will be covered.

In preparing proper KMS, we can use the KMS best practices of some previous organizations, such as mapping and formulating the knowledge strategy, creation, identification, classification, capture, validation, transfer, maintenance, archival, measurement, and report.

Step 4: Determine and Prioritize the Needs

We need to assess what technology can enhance and automate knowledge management-related activities in this step. Based on the program objectives established, we should determine and prioritize requirements in knowledge management technology. We also need to understand that the knowledge management solutions on the market are extensive and varied. It is essential to know the background of each service provider, then analyze the costs and benefits of each type of technology and find out which solution can help us for achieve our goals.

Besides that, understanding what employees use today and what is working and not working for them can become an excellent approach to understanding the needs. Choosing the right technology cannot be done appropriately without determining the current technologies which may meet the organization's needs.

Step 5: Assess Current Condition

After we established the program objectives, prepared for the cultural changes management, defined a high-level process, and determined

and prioritized the technology needs, we must assess our organization's current state of knowledge management. This assessment should cover the five core components of knowledge management: people, processes, technology, structure, and culture. It should be noted that the assessment should usually provide an overview of three aspects: the current state, the gap between the current condition and desired condition, and recommendations to fill the gaps. The results of this assessment will be used as foundation for establishing the roadmap.

Step 6: Create the To-Be Condition and Milestone to Achieve the Ideal Situation

After assessing the current-state condition, it can be said that we comprehend all information about the current condition. Then, we must build the implementation roadmap as our guidance in realizing the knowledge management program. However, before going too far, we have to confirm and re-confirm if we got the senior leadership's support, commitment, and funding to implement and maintain the knowledge management program until it can be deployed. Without leadership support, the efforts and project will not run smoothly and are more likely to become futile. Solid evidence of the organization's shortcomings via the assessment may drive the urgency rate up and open the leader's eyes.

In addition, we need a strategy to address the critical shortfalls in gaining leadership support and obtaining the funding we need. This strategy can be presented as a related project roadmap, addressing the gaps identified during the current state assessment. We can create a roadmap in the form of monthly, quarterly, semi-annually, or annually, and it is also important to illustrate the key milestones and dependencies. A good roadmap will be a great start to support the next steps.

As time progresses, we continue reviewing and evolving the roadmap based on changing economic conditions and business drivers. This action should be taken because sometimes we have to face an unpredictable situation. We also need to make the schedule to manage

the project continuity. Later, this step will give us additional insight through the lessons learned and may be applied in future projects.

Step 7: Implementation of KMS

Implementing a KMS program and maturing the organization's overall effectiveness will require significant personnel resources and funding contribution. We have to prepare for the possibility of the long haul, but make sure that we have to make incremental advances and celebrate them. We should remember that the organization recognizes the value and benefits of the developing program to reduce the resistance and continue investing in knowledge management.

After that, it is time for the rubber to meet the road, as we understand the objectives clearly. We already have a proper solution to mitigate cultural issues. We can also determine what technologies are appropriate to launch the knowledge management program. Further, we know the gaps and have a roadmap to tell how to address them. When we advance through each step of the roadmap, we need to ensure the completion of our short-term objectives and report it. Failing to do this will bring consequences for our program to lose momentum and support from key stakeholders.

Step 8: Measure, Evaluate, and Improvement

This step is critical because we should understand how well our knowledge management investments work. We need to provide the framework to measure the effectiveness and compare it to anticipated results. Before implementing the knowledge management program, we must establish baseline measurements to capture the organization's performance. Then, after implementation, we need to compare the new results to the old results to see how well performance has been done.

The value resulting from the knowledge management system cannot be seen immediately. Sometimes the process will take time. So, if the results are not meet our expectation, we can always make the corrections and adjustments along the way.

We must determine the appropriate methods to measure our organization's progress, for example establishing a balanced scorecard that provides performance, quality, compliance, and value metrics. The key point behind establishing a knowledge management balanced scorecard is that it may provide valuable insight into what is working and what is not. Based on this result, we can then take the necessary actions to correct any mistakes to ensure high compliance, performance, quality, and reduce value gaps, thus improving the overall efficacy of the knowledge management program.

F. Conclusion

Implementing a comprehensive knowledge management system (KMS) takes considerable time and resources. However, the results will undoubtedly be worth the effort. We can also minimize risk by taking a phased approach that gives beneficial returns at each step. Education organizations that have invested in knowledge management must realize that they cannot get tangible results immediately. In other words, this investment is designed to be fruitful in the long-term.

As we already stated, in building KMS, we must ensure the eight knowledge management steps have been performed thoroughly. We do not need to make it directly once a time, as it should be executed step-by-step. When building KMS, we also need to pay special attention to three success factors in information system: service quality, information quality, and system quality. These factors can generate proper system usage and high user satisfaction, which will later help students and educators gain more benefits than before.

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