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Knowledge Management Solution Identifying the Right KM Solution Case Study: Digilib Library Information System

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ABSTRACT

Libraries are knowledgeable organizations that is very valuable. It can be explicit knowledge, such as books, journals, and documents, as well as implicit knowledge, such as employee experience and skills. Knowledge management (KM) is the process of managing knowledge to improve organizational effectiveness and efficiency. KM can help libraries to improve services, reduce costs, and increase innovation. Identifying the right KM solution is an important process for libraries to undertake. This process can help the library to choose the most appropriate KM solution to meet its needs. In this journal, the authors use a case study of Digilib Library Information System to show how the KM solution identification process can be carried out. The authors found that the KM solution identification process consists of three stages, the needs analysis stage, the solution evaluation stage, and the solution selection stage. Based on the research results, the author concludes that the process of identifying the right KM solution is a complex process and requires the involvement of various parties. However, this process is important to do so that the library can choose the most appropriate KM solution to meet its needs.

Keywords: *knowledge management, library, KM solution, needs analysis, solution evaluation, solution selection*

1. INTRODUCTION

In today's digital era, knowledge management (KM) is an important key in optimizing organizational performance. KM helps organizations in collecting, organizing, and distributing knowledge within the organization. One of the interesting KM applications to study is the library information system, especially the Digilib system. Libraries have an important role as a center of knowledge. With the help of information technology, libraries can provide wider and faster access to users. However, the challenge faced is how to manage the knowledge in the library effectively and efficiently. KM solutions can be the answer. This case study will discuss how KM solutions can be identified and applied to the Digilib library information system. The purpose of this case study is to show how KM can help libraries improve their services to users. Hopefully, this case study can be a reference for other libraries who want to implement KM in their system.

This case study will serve as a guide in identifying the right KM solution for the Digilib library information system. Thus, the library can be more optimal in providing services to users. In addition, this case study is also expected to contribute to the development of KM, especially in the context of libraries.

2. LITERATURE REVIEW

A. Knowledge

Knowledge is information or information that a person knows or is aware of. Knowledge includes, but is not limited to descriptions, hypotheses, concepts, theories, principles and procedures that are Bayesian Probability correct or useful. Knowledge can be acquired through various means, such as experience, learning, and research. Knowledge can be explicit knowledge, which is knowledge that can be expressed formally and can be shared easily, or implicit knowledge, which is knowledge that is difficult to express formally and difficult to share.

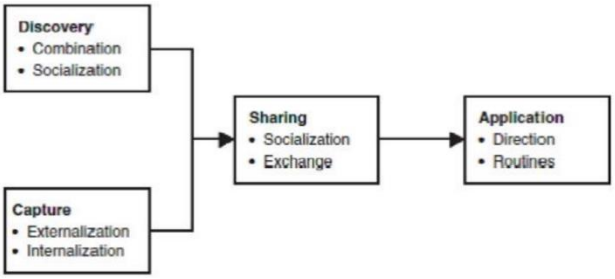

Figure 1 Knowledge Concept
Source author/researcher

Knowledge has an important role in human life. Knowledge can be used to solve problems, make decisions, and improve understanding. Knowledge can also be used to increase productivity, innovation, and competitiveness. Here are some examples of knowledge:

a) Knowledge of how to drive a car
b) Knowledge of math formulas
c) Knowledge of Indonesian history
d) Knowledge of how to cook

Knowledge can be classified in various ways, such as:

a) Based on its source: Knowledge can come from experience, learning, or research.
b) Based on its nature: Knowledge can be either explicit knowledge or implicit knowledge.
c) Based on its scope: Knowledge can be general knowledge or specialized knowledge.
d) Based on the level of accuracy: Knowledge can be either true knowledge or false knowledge. Knowledge is a valuable asset for humans. Knowledge can help humans to achieve their goals and improve their quality of life.

B. Knowledge Management Concept

The concept of knowledge management (KM) focuses on strategically managing knowledge in an organization or community. There are four processes in knowledge management, namely discovery capture, sharing and application. some key aspects of the KM concept:

1) Knowledge as an asset: KM recognizes that knowledge is a valuable organizational asset, just like financial or physical assets. Knowledge can take the form of:
   a) Explicit knowledge: Information that is easily articulated and documented, such as reports, manuals, and data.
   b) Implicit knowledge: Individual skills, experiences, and intuitions that are difficult to express formally.
2) Knowledge cycle: KM focuses on a continuous cycle of knowledge, including:
   a) Knowledge creation: Identifying, capturing and storing new knowledge.

b) Knowledge dissemination: Sharing knowledge with others through various channels.
c) Knowledge application: Using knowledge to solve problems, make decisions, and enhance innovation.

3) Technology and processes: KM utilizes various technologies and processes to support knowledge management, such as:
   a) Knowledge management system: A platform for storing, managing, and accessing knowledge.
   b) Knowledge sharing community: Forums and networks for sharing knowledge and experience.
   c) Organizational learning process: Strategies to promote learning and knowledge sharing throughout the organization.
4) Benefits of KM: Organizations that implement KM effectively can reap various benefits, such as:
   a) Performance improvement: Increase productivity, innovation and competitiveness.
   b) Cost reduction: Reduce duplication of work and increase efficiency.
   c) Improved decision-making: Make better decisions based on more complete information.
   d) Increased customer satisfaction: Provide better customer service.
   e) Improved employee retention: Ensuring knowledge is not lost when employees leave the organization. The concept of KM continues to evolve and adapt to changes in technology and the business environment. However, the basic principles of KM remain relevant for organizations that want to effectively leverage their knowledge assets.

C. Knowledge Management Solution

Knowledge Management solution is a way to collect, store, and share knowledge within an organization. It uses technology and methods to support the four aspects of Knowledge Management, namely finding relevant knowledge, capturing new knowledge, sharing knowledge with others, and applying knowledge to solve problems.

3. METHODS

The methodology used in this research is to use the methodology developed by Fernandez to obtain the Knowledge Management Solution design and the Unified Software Development Process (USDP) as a methodology for developing KMS prototypes. The stages in the methodology for obtaining a Knowledge Management Solution design based on Fernandez, are:

I. Analyzing contingency factors At this stage the contingency factors that affect the company will be analyzed. The contingency factors that affect the KM process have been discussed in the previous sub-chapter.
II. Identifying KM processes Based on each contingency factor, KM processes that support the contingency factor will be selected at this stage.
III. Prioritizing KM processes At this stage, scoring will be carried out for each KM process contingency factor. A score of 1.0 will be given if the KM process supports the contingency factor and 0.0 otherwise. A score of 0.5 will be given if the KM process supports each contingency factor.
IV. Identifying KM processes that have been implemented previously At this stage, identification of existing KM processes in the company will be carried out.

V. Identifying additional KM processes After getting the results from stages 3 and 4, the KM processes obtained in stage 4 will be compared with stage 3, if there is a difference, it will be identified whether or not the KM process needs to be added.

VI. Analyzing KM infrastructure and identifying KM process sequences Organizational culture, organizational structure and environmental conditions will be assessed to determine the KM infrastructure.

VII. Develop the required KM system. In this last stage, the KM system will be developed according to the results obtained from stages 1 to 6. The stages of developing a KMS prototype with the USDP technique use the following UML models:

a) Analysis Model
Refine and detail the definitions of each *use case*.

b) 2. Design Model
Defines the static structure of the system such as subsystems, classes and user interfaces that have their respective relationships within the framework of the system/software being developed.

c) Implementation Model
Load components (representing code in a specific programming language of choice) and mapping classes to components.

d) Deployment Model
Physically define computer nodes and map each component to each existing computer node.

e) Testing Model
Describes test cases and procedures whose purpose is to verify the software produced by looking at and ensuring whether each *use case* has been implemented in a way that matches the main functionality covered in it.

3. RESULTS AND DISCUSSION

A. Knowledge Management Solution

1. Contingency factor analysis

Three contingency factors that determine the design of knowledge management solutions, namely analysis of task characteristics, knowledge characteristics and analysis of organizational and environmental characteristics.

a. Task Ucertainty

KM Proces	Contigency fac
	Task Unceritainty
Combination	Low
Soscializion for knowledge discovry	High
Soscializion for knowledge Sharing	High
Exchange	Low
Externallization	High/low

Figure 2 Task Ucertainty
Source author/researcher

The high level of task uncertainty indicates that routine and repetitive tasks involving knowledge can be well integrated into organizational activities.

b. Task Interdependence

KM Proces	Contigency fac
	Task Interpendence
Combination	low
Soscializion for knowledge discovry	high
Soscializion for knowledge Sharing	High
Exchange	High
Externallization	Low
internallization	High

Figure 3 Task Interdependence
Source author/researcher

This is because equilib still involves coordination between various tasks or organizational units, such as general, faculty, students, and administrators so that task independence can tend to be high.

c. Tacit vs Explicit

KM Proces	Contigency fac
	Explisit(E) Or Tacit (T) Knowlege
Combination	T
Soscializion for knowledge discovry	T
Soscializion for knowledge Sharing	T
Exchange	T
Externallization	T
internallization	T

Figure 4 Tacit vs Explicit
Source author/researcher

Tacit knowledge (knowledge gained from a source) is more relevant in developing routine procedures. This is because tacit knowledge can be used to document the learning process and learning outcomes.

d. Procedural vs Declarative

KM Proces	Contigency facto
	Procedural (P) Or Declarative(D) Knowladge
Combination	P
Soscializion for knowledge discovry	P
Soscializion for knowledge Sharing	P
Exchange	P
Externallization	P
internallization	P

Figure 5 Procedural vs Declarative
Source author/researcher

Procedural knowledge (how to do something) is still needed at the routines stage. This is because procedural knowledge can be used to operate the e-library system.

2. KM Process Identification

From the previous process, the contingency factors obtained can be concluded as follows:

i. Task Characteristics
   a) Task Uncertainty: Low
   b) Task Interdependence: High
ii. Knowledge Characteristics

Tabel 1 Knowledge Characteristics
Source author/researcher

KM Process	Contigency factors						
	Task Unceritainty	Task interpedence	Explisit(E) Or Tacit(T) Knowledge	Procedural (P) Or Delarative(D) Knowledge	Organizational size	Bussines Strategy	Environmental Uncertainty
Combination	Low	Low	T	P	Large	D	High
Soscializion for knowledge discovery	High	High	T	P	Large	D	High
Soscializion for knowledge sharing	High	High	T	P	Large	D	High
Exchange	Low	High	T	P	Large	LC/D	Low
Externallization	High/Low	Low	T	P	Large/Small	LC/D	High
Internallization	Low	High	T	P	Large/Small	LC/D	High

Description:

a) Combination
   Combination (Tacit to explicit), which is a process that combines various explicit knowledge in an organization and then processed into a new explicit experience so that it is easily understood and transferred to other individuals in the organization. In the case study of digilib in the edigilib system, it is definitely Tacit to explicit because the knowledge of a person or organization is collected into one.
b) Socialization for knowledge discovery
   Socialization for knowledge discovery in knowledge management refers to the process by which individuals or groups share knowledge and experiences directly through social interaction in this Digilib case study, each of them collects their understanding in the form of journal writings, theses, and pictures etc.
c) Socialization for knowledge sharing
   "Socialization for knowledge sharing" in knowledge management refers to the process by which individuals or groups interact socially to share and transfer knowledge between each other. It involves communication, discussion, and collaboration to facilitate the flow of knowledge within an organization. In the Digilib case study, it can be explained that it refers to how students can access information provided by the digilib.
d) Externalization (Tacit) Task Uncertainty high/low

Externalization focuses on transforming individual knowledge into knowledge that can be shared by members of the organization In this case study, whether Digilib in externalizing knowledge management has a high or low level of task uncertainty depends on the information available on Digilib. For example, if we are looking for information about a paper, there are two possibilities: available or not available.

a) Task Interdependence, including low
The relationship between tasks or work that must be done within an organization or team. In situations where it is used to develop personal knowledge that is not required for team collaboration or group tasks, the level of task dependency may be lower.

b) Explicit (E) or Tacit (T) knowledge
This refers to tacit knowledge, which is knowledge that is difficult to express explicitly and is more related to the experience, intuition, and understanding of the person sharing it on the digilib. And also the context of externalization,ilib can help unearth the tacit knowledge held by individuals or groups and turn it into explicit knowledge that can be disseminated to members of the organization.

c) Procedural (P) or Declarative (D) Knowledge P/D
Because of Procedural Knowledge (P): Procedural knowledge is the knowledge of "how to do something." It includes the procedures, steps, skills, and actions required to execute a particular task or activity. Digilib can be used as a source of reference or reference. For example, the digilib provides documents such as pictures, skirpsi, journals, learning materials that can be used by students as references.

d) Organizational Size Small/Large
The use of Digilib in knowledge management externalization does not depend on the size of the organization, but rather on its needs, strategy, and available resources. Both large and small organizations can leverage Digilib to optimize their knowledge externalization, given that the approach and scale of implementation may differ.

e) Business Strategy LC/D Due
On Low Cost: The use of digibils to reduce training costs and which can save time and money. while on Differentiation: The use of digibits to provide a unique and high-quality learning experience to students.

f) Environmental Uncertainty High/Low
High environmental uncertainty in the context of Knowledge Management (KM) in library information systems (LIS) can create challenges that require a flexible and responsive approach.

e) Exchange
"exchange" refers to the process by which individuals or groups share, transfer, or exchange information, knowledge, or experiences with each other. In the digilib case study, it can be explained that it refers to the process where students and digilib managers interact to share information and knowledge related to learning materials.

f) Internalization (Explicit)
In the internalization stage, knowledge that has been transformed into explicit knowledge through the previous externalization process is now put back into the individual or group.
   a) Task Uncertainty Low.
      Focus on understanding, learning and using explicit knowledge after the externalization process. Learning complexity, participants' abilities, instructional design, and organizational structure are important factors.
   b) Task Interdependence High/Low.
      Depending on the organizational context. In highly interdependent tasks, digilib can ensure all team members have the necessary knowledge. In self-directed tasks, digilib allows individuals to understand and internalize knowledge independently.
   c) Explicit (E) or Tacit (T) knowledge:
      Explicit. The main focus is on how students internalize the knowledge provided in the form of journals, theses, and other materials.
   d) Procedural (P) or Declarative (D) Knowledge
      P/D. Internalization involves both types of knowledge. Participants can internalize both procedural (how to do something) and declarative (what we know) knowledge, according to the learning content.
   e) Organizational Size Large.
      Large organizations may have greater resources and infrastructure to support digilib initiatives, including advanced platforms, content development teams, and technical support.
   f) Business Strategy LC/D:
      Depends on the business strategy: Low Cost (LC): Reduce employee training and development costs, improve operational efficiency. Differentiation (D): Deliver high-quality training and unique learning experiences to customers and employees.
   g) Environmental Uncertainty:
      Dependent on external factors: High: If technological, regulatory, or market changes occur quickly.
      Low: If the organization has adopted a stable digilib technology and environmental changes are under control. Choice of Information System (Library or Digilib) Depending on the level of uncertainty in the organization's environment: High: If the library or digilib is experiencing rapid changes in technology, regulation, or user needs. Low: If the information system has stabilized and environmental changes are well predicted. The choice between high or low depends on the dynamics and specific needs of the library or digibi information system in the organization. Changes in technology, regulations, and user needs need to be assessed to determine the level of environmental uncertainty.

g) Direction
This step involves establishing guidelines, rules, and regulations to be followed by members of the organization to acquire, create, and share knowledge. Suitable for situations where the organization faces high levels of uncertainty, complex tasks, and the need to provide clear instructions.

a) Task Uncertainty = Low
Low levels of uncertainty indicate that the task has clear parameters, well-defined objectives and a relatively stable environment. Task performers have sufficient information to plan and execute work with high confidence regarding certain aspects of the task.
b) Task Interdependence = High
A digilib often involves many people, such as teachers, learners, and administrators. The success of the digilib also depends on good cooperation and coordination between the parties involved. This makes the digilib very useful for some people who want to find books.
c) Explicit (E) or Tacit (T) knowledge = (T)
In equilib, knowledge about how to read online and interact with learners is more tacit, as it is usually acquired through experience and skills in interacting with some people who want to find books.
d) Procedural (P) or Declarative (D) Knowledge = D
In a library digibook, users can easily access basic information and facts related to the digital library collection. This helps users to search, understand and use the information resources available in the library effectively.
e) Organizational Size = Large
With a large organizational scale, a library may have abundant resources, a wide range of collections, and the capacity to provide complex services. This can mean more options of information resources, programs, and services that can be accessed by users using the library's digilib website. The size of the organization can also affect the level of complexity of management and resource management in the library.
f) Business Strategy LC/D = D
g) Digilib focuses on providing services or resources that are unique and different from those offered by other libraries, rather than simply competing on the basis of low cost. However, without further information, this interpretation is speculative and may vary depending on the specific context of the statement.
h) Environmental Uncertainty = Low
Digilib refers to external factors that may affect library operations and management, such as changes in technology, government policies, or user preferences.
With low levels of environmental uncertainty, libraries may operate under relatively stable conditions. This can make it easier to plan, develop strategies, and manage resources because the external factors that can affect library performance have a high degree of certainty or predictability.

h) Routines
This stage involves creating and implementing routine, standardized procedures and structured activities in knowledge management for habit formation. Suitable for situations where the organization faces a low level of task uncertainty, tasks are routine or repetitive, and there is a need to integrate knowledge into daily operations.
a) Task Uncertainty = High

The high level of task uncertainty indicates that routine and repetitive tasks involving knowledge can be well integrated into organizational activities.

b) Task Interdependence = High
This is because equilib still involves coordination between various tasks or organizational units, such as general, faculty, students, and administrators, so task independence can tend to be high.

c) Explicit (E) or Tacit (T) knowledge = T

d) Tacit knowledge (knowledge gained from a source) is more relevant in developing routine procedures. This is because tacit knowledge can be used to document the learning process and learning outcomes.

e) Procedural (P) or Declarative (D) Knowledge = P
Procedural knowledge (how to do something) is still needed at the routines stage. This is because procedural knowledge can be used to operate the e-library system.

f) Organizational Size = Large Organizational
Size is large at the routines stage. This is because it is applicable in large organizations.

g) Business Strategy LC/D = D
The business strategy is still differentiation at the routines stage. This is because Digilib is still used to differentiate the organization's products or services from competitors.

h) Environmental Uncertainty = Low
A more structured and predictable environment allows organizations to develop routine procedures that are effective in managing knowledge.

3. Assessing KM Process Prioritization

At this stage, the KM process will be weighted.

Tabel 2 Assessing KM Process Prioritization
Source author/researcher

Contingency Factors KM Processes	Task Uncertainty: High	Task Interdependence: High	Tacit Knowledge	Procedural Knowladge	Organizational size: Small	Businnes Startegy: Low Cost	Environmental Uncertainty: High	Number of "Yes"	Number of "OK"	Number of "No"	Cumulative Priority Score
Combination	No	No	Yes	Yes	No	No	Yes	3	0	4	3.0
Soscializion for knowledge discovry	Yes	Yes	Yes	Yes	No	No	Yes	5	0	2	5.0
Soscializion for knowledge Sharing	Yes	Yes	Yes	Yes	No	No	Yes	5	0	2	5.0
Exchange	No	Yes	Yes	Yes	No	Ok	No	3	1	3	3.5
Externallization	Ok	No	Yes	Yes	Ok	Ok	Yes	3	3	1	4.5
internallization	No	Yes	Yes	Yes	Ok	Ok	Yes	4	2	1	5.0

Direction	No	Yes	Yes	Yes	No	No	No	3	0	4	3.0
Routines	yes	Yes	Yes	Yes	No	NO	No	4	0	3	4.0

B. BPMN Process for Digilib Library Information System

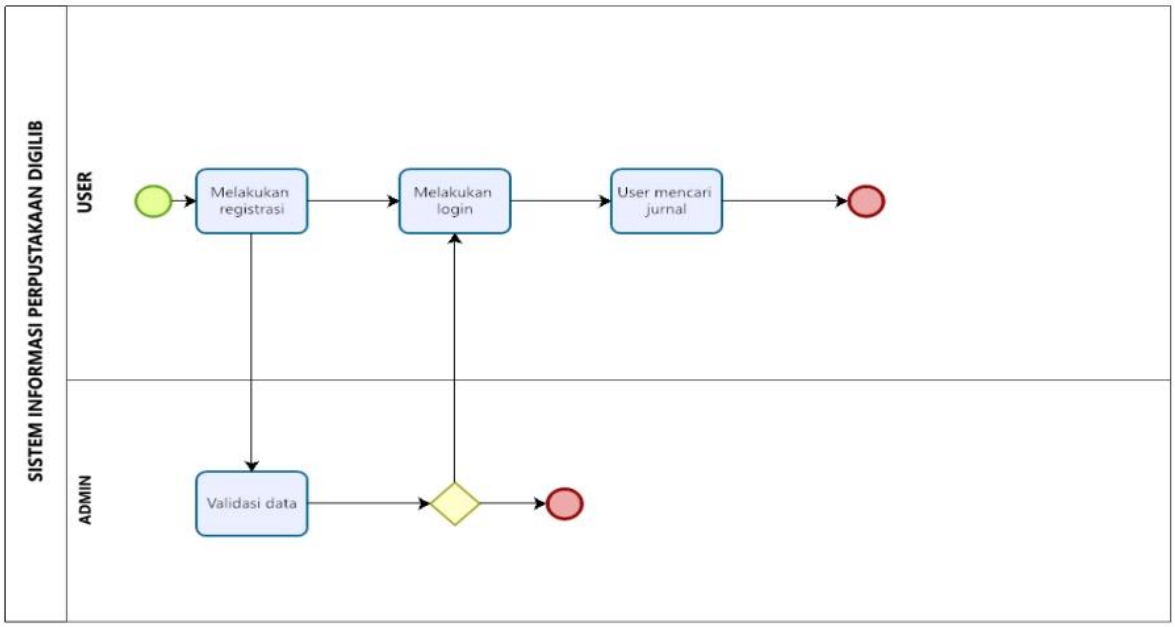

Figure 6 BPMN Process for Digilib Library Information System

Description of the process flow in the library information system digilib:

a) On the dashboard, the user selects the `member register` butoon to register an account.
b) In the member register view, the user fills in data such as email, full name, address, city, country, institution, job, password, security code. If it has been filled in the user presses the `send` button.
c) Admin will receive user data and validate it.
d) User logs into digieleb account
e) Users can already access and get information from digielib.

The user searches in the `search bar` using the keyword they want to search for.

4. CONCLUSION

From the research results of Knowledge Management for the UEU digilib website, it can be concluded that: Knowledge Management System is one of the solutions for the Digilib website in contributing to governance and human resources in the organization. Readiness in implementing Knowledge management also affects the process of designing and developing a knowledge management system. This digilib website is feasible to implement because the features designed allow it to be a tool for staff, lecturers, and students to store, share and disseminate their knowledge.

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