International Journal of Computer Applications Technology and Research
Volume 8–Issue 05, 170-175, 2019, ISSN:-2319–8656

# Application of Knowledge Management System Using Influence of Inukshuk and Kano Model (Case Study : Palembang Private Higher Education)

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**Abstract**: Knowledge management is needed in any field without the exception of education. This research developed the Knowledge Management process by combining the Inukshuk model and the Kano model. The purpose of this study is to facilitate knowledge management control and combine the two models to produce a KMS prototype that is well suited to the needs of the user. Inushuk is an expansion of KMS with the addition of Leadership, Culture, and Technology components to measure KMS needs to be implemented into a KMS prototype feature. The Kano model serves to filter features into the Kano category namely Must Be, performance, and Delighter. The data analysis process of the Inukshuk model uses index data analysis while the Kano model in analyzing the data uses the Kano calculation method. The results of the study of combining the two models resulted in a KMS model that could be used as a reference for the development of KMS for STMIK MDP, CANDRADIMUKA STISIPOL, and UIGM in managing knowledge. Combining the two methods above produces Chat features, Discussion Forums, Q n A and Document Search.

**Keywords**: Knowledge Management, Inukshuk, Kano, Combining, Technology

## 1. INTRODUCTION

In this time knowledge management is needed in any field without exception in the world of education. Sometimes the problem faced is the difficulty of getting a knowledge that was previously known. This is due to the lack of knowledge management of an organization to summarize the problems that have been resolved. Knowledge management is needed to summarize existing knowledge or new knowledge acquired in the present, and can be used in the future. Understanding of knowledge here is knowledge, experience, factual information and opinions of experts [1]. As said before, an organization must be skilled in managing existing knowledge, so that later it can be used in the future and remain useful for a company or organization.

Understanding and experience are built on knowledge, whether manifested in an individual or inherent in the actual processes and applications of an organization. Knowledge management can also be a decision-making system. The decisions that will be taken can be summarized from the management of knowledge that has been made.

In this paper, knowledge management will be made in the field of education. Starting from how the teaching staff can continue to teach well and can save the knowledge of teaching to young teachers, so as to achieve customer satisfaction in this case students. Until the change of position or structural in a college that makes it easier for new officials to understand what authority and responsibility must be considered?

This study designed the KMS of the Inukshuk and Kano models. The Inukshuk method itself is often used because the method in knowledge management is an extension of the SECI method, namely by adding several components such as Leadership, Culture, and Technology. The Kano diagram itself is a diagram that divides customer specifications into three types, must be, performance and delighter and compares the existence of a specification [2]. Both of these models have their respective advantages, therefore, this study combines the two models in managing knowledge in the Palembang private university. The formulation of the generated KMS model will be formed into a prototype that can be evaluated according to the needs of the knowledge management process at the high level. To be easily accessed and used by teaching staff from web based. The purpose of this study was to create a KMS model at the private tertiary institution of the city of Palembang along with the making of a KMS prototype to facilitate knowledge management control with the Inukshuk and Kano approaches.

## 2. LITERATURE REVIEW

### 2.1 Knowledge Management System

According to [3], a knowledge management system (KMS) is a system that can be used to facilitate knowledge management processes, so that KMS can be divided into each knowledge management process, namely knowledge discovery system, knowledge capture system, knowledge sharing system and knowledge application system.

Starting from Knowledge Management, Knowledge Management (KM) is an expression that describes a series of strategies, systems and techniques used by individuals, teams and corporations to manage knowledge. There are various definitions of knowledge management and also the definition of knowledge that is developing but has not yet reached a global agreement. Knowledge management is a topic that continues to look for forms among researchers. KM in Indonesian can also be called *Management Pengetahuan* (MP) and is discussed directly by academics in knowledge management, and to answer the needs of practitioners who want a simple picture of knowledge management. Knowledge

management is defined as the concept of knowledge management which includes the following knowledge management processes [3].

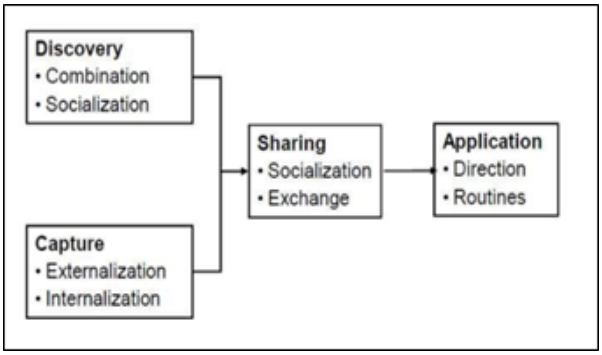


Figure. 2.1 Knowledge Management Process [3]

### a. *Knowledge Discovery*

Defined as the development of new tacit knowledge or explicit knowledge, from data and information or from prior knowledge integration. New explicit knowledge, found through a combination of prior knowledge of knowledge. While new tacit knowledge is found through socialization between individuals.

### b. *Knowledge Capture*

Defined as the process of receiving explicit and tacit knowledge. The knowledge capture process comes from two Knowledge Management sub processes, namely externalization and internalization.

### *c. Knowledge Sharing*

it is the process of communication with explicit or tacit knowledge between individuals. This process involves two sub-processes, namely socialization and exchange. Socialization focuses on tacit knowledge sharing, while exchange focuses on explicit knowledge.

### *d. Knowledge Application*

it Depends on the knowledge available in the previous knowledge process, namely knowledge of discovery, capture, and sharing. In the Knowledge Management process there are sub-processes of direction and routines. Direction refers to the process by which individuals have direct knowledge of the actions of other individuals without sharing with the individual, the knowledge underlying the direction of the action. Routines are related to the use and understanding of explicit knowledge that has been established in the organization.

## 2.2 INUKSHUK

Nonaka and Takeuchi (1995) [4] had proposed the SECI model which had become the foundation of knowledge creation and transferring theory. This model distinguishes two dimensions of knowledge as tacit and explicit knowledge, and proposes a process of knowledge creation through social interaction to convert knowledge between two dimensions.

Knowledge was divided into tacit knowledge and explicit knowledge as two main types of human knowledge [4]. There are also 4 processes of knowledge conversion, namely socialization, externalization, combination, and internalization or often referred to as SECI. The knowledge conversion can be drawn in the following spiral knowledge [4].

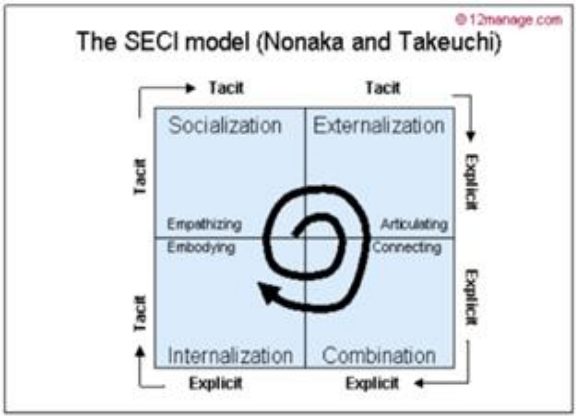


Figure. 2.2 SECI Model [4]

### a. Socialization

Conversion from Tacit Knowledge to Tacit Knowledge. Tacit Knowledge is delivered to others through the socialization process in organizations. The socialization process can be done through social interaction and sharing experiences between members of the organization.

### b. Externalization

Conversion from Tacit Knowledge to Explicit Knowledge. Externalization is the process of converting hidden knowledge into actualized (explicit) knowledge. For example experience, ideas or desires become a source of knowledge from prototypes, models, books, blogs, and others.

### c. Combination

Explicit Knowledge conversion to Explicit Knowledge. Combination is the concept of creating explicit knowledge by combining, categorizing, and collecting two existing or more explicit knowledge.

### d. Internalization

Explicit Knowledge Conversion to Tacit Knowledge. Explicit Knowledge is learned to then proceed with new ideas or actions.

The Inukshuk Knowledge Management model is an enhanced framework of the SECI model with the addition of components such as Leadership, Culture and Technology. The connection with Knowledge Management is that it can provide information about Tacit and Explicit Knowledge in the organization [5].

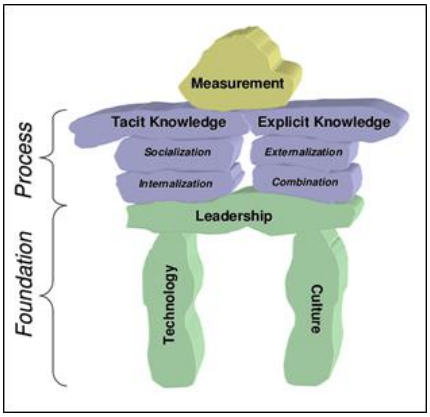


Figure. 2.3 Inukshuk Knowledge Management Model

Inukshuk Knowledge Management model stages in detail per stage as follows:

### a. Leadership

In this process, an Explicit Knowledge is needed so that decisions and leadership styles of Top Managers can be shared with other employees through Knowledge Management. he leader must also be able to motivate employees in implementing Knowledge Management. One way that can be done is to provide concrete evidence of involvement in the use of Knowledge Management [6].

### b. Culture

To create a culture of sharing between employees, company management can provide intensive or reward systems. reward system here can be in the form of appreciation to motivate employees to share knowledge with other employees, or can use a punishment system for employees who do not want to share [6].

### c. Technology

At this stage is an explanation of what computing technology is used. Can be discussed through software and hardware used.

## 2.3 Kano

The Kano diagram was discovered by Professor Noriyaki Kano from the Tokyo University of Science. Professor Kano made an extraordinary theory about the factors that influence customer satisfaction with what is given by a product or service. This theory is known as the Kano Model or Kano Diagram. Kano Model or Kano Diagram is a diagram that divides the specifications of the products given to customers into three types, they are Must be, Performance, and Delighter. below :

### a. Must Be

These are things that must exist in a product. He must exist. But its existence will not increase customer satisfaction. Customers will act normal. If it's not there, then get ready you will be complained by the customer. In Kano this model is described as a turtle that is located at the bottom. It is an attribute, function or basic feature that is mandatory for a product / service.

### b. Performance

These are factors that are also known as more is better, more are better. If we fail to fulfill it, the customer will be disappointed. If we can fulfill it, then the customer will be mediocre. However, if we exaggerate it, the customer will be happy. The better the performance of this attribute, the higher the level of customer satisfaction. Conversely, poor performance of this attribute can also decrease. Customer satisfaction. An example when reading a brochure is a laptop that has the i5 processor, but it turns out that when the item is received i3. But if it turns out that the laptop purchased has an i7 processor, then the customer will be very satisfied.

### c. Delighter

Delighter is more to satisfy customers. If we don't give, customers will not be disappointed, but if we provide this specification, customers will be very satisfied. Example: giving a high end portable sound system when buying a laptop will make customers very satisfied. It should be noted that this will shift over time and the level of competition. Today the Delighter, tomorrow may be Performance and could be the next year Must Be. The example of a webcam on a laptop follows the diagram of a kano or a Kano Model.

# 3. RESEARCH METHODOLOGY

## 3.1 Research Design

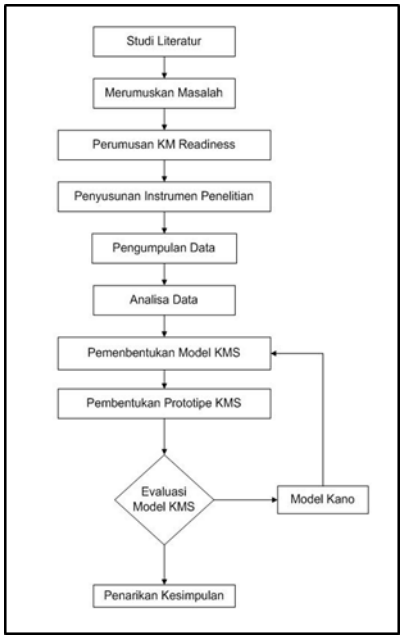


Figure. 3.1 Research Design

## 3.2 Collecting Data Method

The method of data collection in this study was divided into two types, namely primary and secondary data collection methods. Both methods support each other. Primary data is collected through interview processes and questionnaires while Secondary Data is collected from organizational documentation in Higher Education.

## 3.3 Data Analysis Method

### 3.3.1 Index Analysis Method

The analysis method used in the research questionnaire analysis process is the index analysis method. Questionnaires that have been distributed and filled out by responder are followed up with measurements of their respective values, the measurement results will be analyzed by the index analysis method so that it will produce conclusions from the research.

### 3.3.2 Kano Calculation Method

The Kano Diagram is a diagram that divides the specifications of the products given to customers into three types, namely Must Be, Performance, and Delighter. In this study the questionnaire will play an important role in the research process. Kano calculations are carried out in the prototype evaluation process. So that method will produce conclusions from the research.

# 4. RESULTS AND DISCUSSION

The process of preparing research instruments in the form of a questionnaire design. The design of this questionnaire was made based on the results of the literature studies that have been conducted. The questionnaire in this study was divided into three questionnaire needs.

### a. KM Readiness

Knowing the readiness of Higher Education in implementing knowledge management system is very important, so that measurement of knowledge management Readiness is very necessary because a good system must have a good place too.

Knowledge management rreadiness can be interpreted as the ability to adopt, use and benefit from that knowledge management.

### b. KM Process Identification Questionnaire

This stage is an identification process that is taken from the second questionnaire data, namely the questionnaire identification of the KM process. Questionnaire questions have represented the KM and INUKSHUK processes, namely socialization, externalization, combination, internalization, leadership, culture and technology.

### c. Kano Questionnaire

To achieve the objectives of this research, it is important to spread the questionnaire sequentially because each questionnaire has its own function. The KM readiness questionnaire is used to see the extent to which Universities are ready to implement Knowledge Management so that the implementation of Knowledge Management can run according to what has been designed.

KM Process Identification Questionnaire which is a questionnaire containing questions about Socialization, Externalization, Combination, Internalization, Leadership, Culture, and Technology, each question representing the criteria so that calculations can be made. Calculation using index data analysis.

The Kano Questionnaire aims to measure the requirements and specifications of the system to be made. Making this questionnaire to combine SECI, INUKSHUK, and KANO methods simultaneously.

## 4.1 Data Analysis

### 4.1.1 Identify the Current KM Process

This stage is an identification process that is taken from the second questionnaire data, namely the questionnaire identification of the knowledge management process. Questionnaire questions have represented the KM and INUKSHUK processes, namely socialization, externalization, combination, internalization, leadership, culture and technology respectively.

Table 4.1. Current KM Process

| KM Process | Index Value | Level |
|---|---|---|
| *Socialization* | 130,2 | High |
| *Externalization* | 127,6 | Medium |
| *Combination* | 123,8 | Low |
| *Internalization* | 122 | Low |
| *Leadership* | 127,8 | Medium |
| *Culture* | 127,6 | Medium |
| *Technology* | 132,4 | High |

### 4.1.2 Identify of the Current KM Process Facilities

After identifying the current KM process the next step is to measure the current KM process facility. Retrieving the index value comes from table 4.1 above because the calculation includes existing facilities.

Table 4.2. Current KM Facilities

| Proses KM | Nilai Indeks | Tingkat |
|---|---|---|
| *Socialization* | 125,4 | Medium |
| *Externalization* | 132,4 | High |
| *Combination* | 125,6 | Medium |
| *Internalization* | 119,2 | Low |
| *Leadership* | 127 | Medium |
| *Culture* | 126,4 | Medium |
| *Technology* | 118,4 | Low |
| **Jumlah** | 874,4 | |

In Externalization facilities that support are very high so implementation will be very easy to do with index value 132.4. Internalization and technology have a low index value.

### 4.1.3 Identify Of KM Process and Supporting Facilities

Based on the results of the identification of the level of processes and supporting facilities for KM processes that occur at the current Private Universities, this stage categorizes the priority needs of the current KM process development.

Table 4.3. Mapping of Categories Needs Now

| KM Process | Current KM Process Level | Curren Level of Supporting Facilities KM | Current KM Development Need Priorities |
|---|---|---|---|
| *Socialization* | High | Medium | 2 |
| *Externalization* | Medium | High | 4 |
| *Combination* | Low | Medium | 8 |
| *Internalization* | Low | Rendah | 9 |
| *Leadership* | Medium | Medium | 5 |
| *Culture* | Medium | Medium | 5 |
| *Technology* | High | Rendah | 3 |

Mapping the current category of knowledge management development needs if in a graph can be seen in graph 4.9. The chart below is based on needs so that the shorter the graph the greater the priority. Internalization and Combination show top priority with priority needs 1.

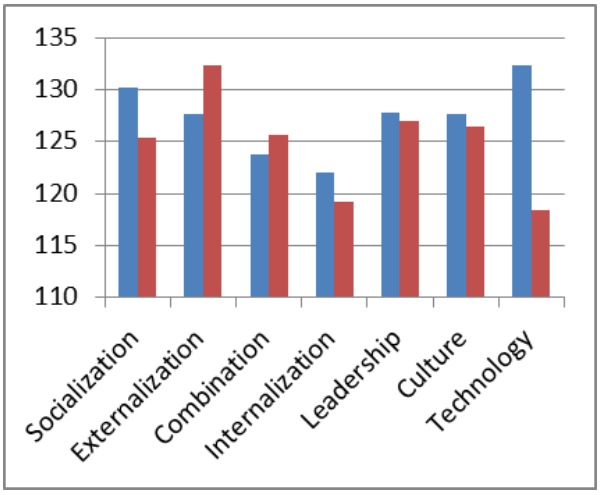


Chart. 4.1 KM Current Needs

Socialization has the highest priority, namely with a value of 2 followed by technology that has a value of 2. The calculation of the second value can be seen in the graph above socialization has 2 bars that are balanced so that it has a high value. Based on the graph above, the creation of features will prioritize features that help socialization and technology.

### 4.1.4 Calculation of The Kano Model

In table 4.3 the knowledge management process is mapped into technology in the form of supporting features in the Knowledge Management system process. These features are then grouped so that the same features are united, namely Chat, Discussion Forum, Chat box, Q n A, Document Management, Article Management, Document Search, Article Search, Knowledge Monitoring, Value Giving, FAQ, Suggestions and Input, Rewarding, Management Rating Knowledge, Responsive. These features will be calculated by Kano so that the group features Must Be, Perfomance or Delighter can be known

Table 4.4. Mapping Of Categories Needs Now

| **KM Process** | **Features** |
|---|---|
| *Socilization* | - *Chattting* (M)<br>- Discuss Forum (M)<br>- *ChatBox* (Q)<br>- *Q n A* (M) |
| *Technology* | - Article Search (O)<br>- Documen Search (M)<br>- *Responsive* (I) |
| *Externalization* | - Chatting (M)<br>- Q n A (M)<br>- Discuss Forum (M)<br>- Document Management (A)<br>- Article Management (O) |
| *Leadership* | - Monitoring Knowledge (A)<br>- Giving Score(A)<br>- FAQ (R)<br>- Sugestions and Input (O) |
| *Culture* | - Giving *Reward* (M)<br>- Knowledge Rank Management (M) |
| *Combination* | - Discuss Forum (M)<br>- Q n A (M)<br>- Document Management (A)<br>- Article Management (O) |
| *Internalization* | - Discuss Forum (M)<br>- Q n A (M)<br>- Article Search (O)<br>- Documen Search (M) |

Socialization, Technology, and Externalization are the highest priorities after calculating questionnaires with the INUKSHUK model. The three knowledge management processes have features that support the process of knowledge management, but not all features will be taken and implemented in making knowledge management system prototyping. Researchers only take features that have a Must Be (M) value or features that must exist in a knowledge management system. If we map between the results of the INUKSHUK model and the Kano model with features as objects, the features that will be made into the system are as follows:

Table 4.5. Features of Questionary Calculations

| **KM Process** | **Features** |
|---|---|
| *Socilization*<br>*Externalizationi* | 1. *Chattting* (M)<br>2. Discuss Forum (M)<br>3. *Q n A* (M) |
| *Technology* | 4. Document Search (M) |

There are four features that will be made into the Knowledge Management system, namely Chat Features, Discussion Forums, Q n A, and Document Search. The four features are the results of the questionnaire inukshuk kano model and are the current knowledge management process needs.

## 4.2 Making KMS Prototypes

The stages of forming this knowledge management system model utilizing the results of data analysis that have been carried out are then formed into the knowledge management system model by looking at the priorities of the knowledge management process that has been recommended with the approach in the previous stage. The formation of knowledge management system prototyping uses an international modeling language namely Unified Modeling Language

(UML) which consists of Use Case Diagrams and Activity Diagrams. The design results are implemented into a prototyping so as to form a system that suits your needs.

### 4.2.1 *Use Case Diagram*

Use Diagram in Figure 4.1 has 2 actors namely admin and user, admin is tasked to manage existing data while the user is to interact, exchange and access information.

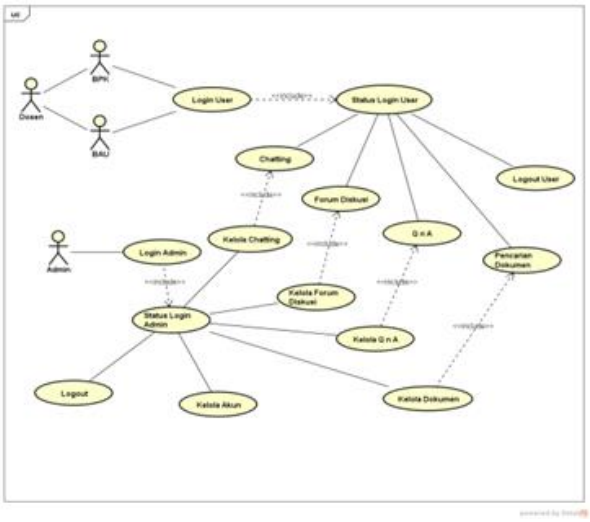


Figure. 4.1 Use Case Diagram

### 4.2.2 *Home Page*

When the user or admin has passed the log in page, the next page will display the home page of the system. On this page display menus which are features that have been calculated. These features are chat, discussion forums, Q n A and Documents.

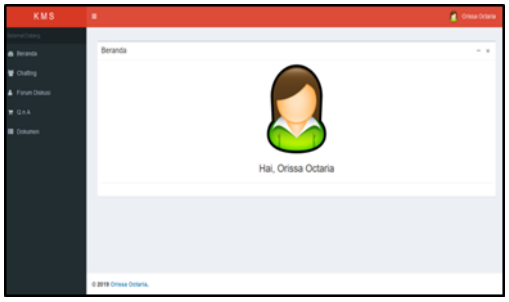


Figure. 4.2 Home Page

## 5. CONCLUSION AND SUGESTION

## 5.1 Conclusion

The conclusions generated in this study are as follows:

a. The KMS design developed in this study used the Inukshuk model and the Kano model.

b. The KM process was used in the process of making the Inukshuk questionnaire namely Socialization, Externalization, Combination, Internalization, Leadership, Culture, and Technology. As for the Kano model, it uses the Must Be, Performance, and Delighter product specifications.

c. KMS designed to produce features that are in accordance with the needs of users and existing facilities so that the objectives of KMS will be easily achieved and useful for structural position changes at STMIK MDP, STISTIPOL Candradimuka, and UIGM.

d. Knowledge Management features after Inukshuk and Kano calculations include Chat, Discussion Forum, Question and Answer, and Document Search.

## 5.2 Sugestion

For the development of further research there are several suggestions related to KM system, including:

a. The scope of the research was extended not only to lecturers, BAU, and BPK, but also included all students.

b. The application of KMS that has been studied only uses web-based technology. Further development is carried out using Android-based technology.

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