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Implementation of the Kano Model and Importance and Performance Analysis in the Development of a Web-Based Knowledge Management System

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ABSTRACT

The student department is a work unit that oversees, accommodates and handles various kinds of student activities, both academic and non-academic. The problem that is usually faced by the student department is the occurrence of a knowledge gap (k-gap) between old and new office holders. This problem is caused by the frequent rotation of positions in university departments, while this position rotation is not followed by holding knowledge sharing sessions between employees. The purpose of this research is to develop a web-based knowledge management system for student departments that can overcome the knowledge gap problem. The method used in this research is the Importance and Performance Analysis (IPA) and the Kano Model. The reason for choosing the IPA method is because IPA can be used to measure the value of respondents' mastery of research attributes and can also measure the importance value of an attribute based on the respondent's perception. The Kano model is used in this study because Kano can categorize the attributes of a product or service based on how well the product/service is able to satisfy customer needs. The result of this study is a student department knowledge management system which can reduce the value of the knowledge gap by 1.63 points.

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1. INTRODUCTION

The quality of a university's students is the main indicator for measuring the quality of a university's performance. The quality of a person's or organization's performance (way of thinking and ability to make the right decisions) is determined by the knowledge one has. Knowledge possessed by a person or an organization is a very valuable asset and an intangible asset [1]. Loss of knowledge in an organization can occur if the following things happen to the knowledge owner: a) affected by position rotation, b) resigned, c) forgot, and d) died. The situation then turns critical when one of the four things happens to someone who is very potential for the progress and sustainability of an organization. To deal with critical situations that may occur in the future, all knowledge in an organization needs to be integrated into a system that can be read, understood, used and developed for the benefit of the organization. Student Department, is one of the organizations that has an official position within the college or campus. This organization was formed with the aim of accommodating student activities, developing certain interests, talents and expertise for the activists in it [2].

The absence of regularity in the process of documenting knowledge (tacit and explicit), the unavailability of access to knowledge and the lack of a knowledge sharing process causes a knowledge gap (k-gap) between the knowledge that should be owned and the knowledge that is actually owned. Knowledge Sharing is a systematic process of sending, distributing and disseminating knowledge and multidimensional contexts from a person or organization to other people or organizations who need it through various methods and media [3].

Based on the background of the problems above, the researcher concludes that student department need a knowledge management system. Information technology-based knowledge management systems in organizations are carried out as a structured effort in developing knowledge to increase human resource assets and improve organizational performance [4].

Researchers build a web-based Knowledge Management System. KMS is made web-based using the Kano method and Importance and Performance Analysis (IPA). The developed KMS is expected to reduce knowledge gaps in student department. The system modeling design used was made using the Unified Modeling Language (UML) tools as a reference in system implementation. KMS is made in the form of a website because the website is a site that can be accessed and seen by internet users around the world or in other words it can be accessed anytime and anywhere [5]. The Kano model was first developed by Dr. Noriaki Kano and his colleagues from the University of Tokyo Rika in 1984 which aims to categorize the attributes of a product or service, based on how well they can meet customer needs [6].

There are several previous studies that have developed a knowledge management system as well as research using the same method used by the researchers in this study. The first research was conducted by Zuraidah (2018) on the topic of developing KMS for HR in employee cooperatives. The methodology used in his research is the SECI method [7]. The weakness in this study is that the proposed system is only a prototype.

The second research is research entitled design and performance measurement of companies based on the agri-food supply chain framework conducted by Seeds Satriono et al. This research was conducted at Sandia Bakery with the aim of knowing the company's performance. The analytical methods used are the Analytical Network Process (ANP), Importance Performance Analysis (IPA), and Root Cause Analysis (RCA) methods [8]. This research is used as a reference by researchers in using the Importance and Performance Analysis method.

Aslamiyah and Agustina conducted a study entitled measuring the knowledge gap (k-gap) using Importance and Performance Analysis and Root Cause Analysis. This research aims to find problems faced by student department and create a knowledge management system to reduce the number of knowledge gaps [9]. The weakness of this research is the limitation of research only up to proposing solutions that are not accompanied by system development.

The contribution made by this study is updating in terms of the use of the methods used, based on research background, this research has problems similar to the research conducted by Aslamiyah and Agustina (2021), previous research conducted by Aslamiyah and Agustina only reached the search for root of the problem and proposing solutions in general, not reaching research on what methods are suitable for use and not extending to the implementation of these methods in the development of KMS as was done in this study.

2. THEORETICAL BASIS

2.1. Knowledge

Knowledge is a collection of information, experience, and values that can be used explicitly [10]. Knowledge comes from data and information that is processed according to organizational policies so that it can become something more valuable. Figure 1 is a hierarchy of data, information and knowledge. Data, information, knowledge, wisdom hierarchy is a conceptual model for understanding how knowledge in an organization is created and utilized [11].

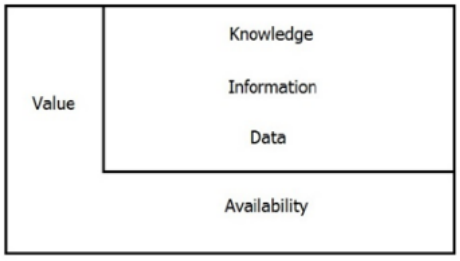

Figure 1. Data And Information Hierarchy

2.2. Knowledge Management

Following are some definitions of knowledge management from several previous researchers:

1. Knowledge Management is a series of activities that are used by organizations both agencies and companies to identify, create and explain in the application of knowledge for reuse, so that it can be known and learned so as to achieve organizational goals [12].
2. Knowledge management is an effective process related to the exploration, exploitation and sharing of human knowledge using appropriate technology and a cultural environment to increase intellectual capital and employee performance [13].
3. Knowledge management is an activity or activity to create, capture, disseminate and use knowledge so that it can be used to achieve organizational goals [14].

Based on the definitions of several previous researchers, the researcher can reformulate that the definition of knowledge management is any form of activity which includes organizing, managing, and managing knowledge, both knowledge in the form of tacit knowledge (knowledge in one's head) and in the form of explicit knowledge (knowledge that has been documented).

The main advantages of implementing knowledge management for organizations are: (1) the existence of more transparent knowledge information, (2) the existence of a knowledge-based added value creation process, (3) increasing staff motivation, (4) increasing competitiveness, and (5) security and organizational resilience for the long term [15].

2.3. Kano Model

The kano model or kano diagram is a model that aims to categorize the attributes of a product or service based on how well the product/service is able to satisfy customer needs. This model was developed by Professor Noriaki Kano from the University of Tokyo Rika [16]. In his model, Kano distinguishes the type of desired product that can affect consumer satisfaction [17] as depicted in Figure 2, namely:

1. Category must-be quality (basic attribute)
2. One-dimensional quality category (expected attribute)
3. Attractive quality category (attributes that can increase customer satisfaction)
4. Category reverse quality
5. Category of indifferent quality

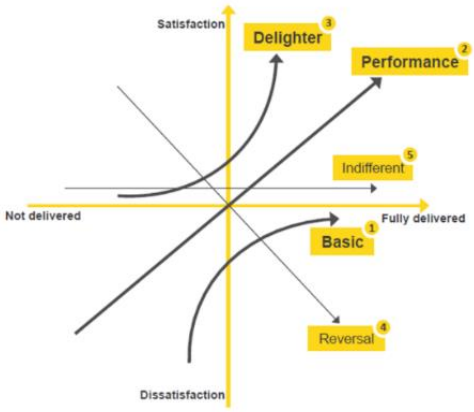

Figure 2. Kano Diagram

The research steps using the canoe model are as follows:
Step 1: identify customer ideas/requests or analyze what will be measured.
Step 2: make a canoe questionnaire

The way the Kano questionnaire method works is as shown in table 1, namely by asking the respondents what if this feature existed in a system and what if this feature was not in the system. The nature of the questionnaire is that each one question has two parts, namely functional and dysfunctional with the answers [18]:

1. I like it that way
2. It must be that way
3. I am neutral
4. I can live with it that way
5. I dislike it that way

Table 1. Kano Questionnare

Question	Answer
Functional question : if the feature existed, how would you feel?	□ I like it that way\
	□ It must be that way
	□ I am neutral
	□ I can live with it that way
	□ I dislike it that way
Dysfunctional question : if the feature existed, how would you feel?	□ I like it that way\
	□ It must be that way
	□ I am neutral
	□ I can live with it that way
	□ I dislike it that way

For each variable it is not given a score in data processing but follows the steps according to the Kano model, namely by using the Kano evaluation table as can be seen in table 2.

Table 1. Kano Evaluation Table

Customer requirement		Disfunctional				
		like	Must-be	Neutral	Live With	Dislike
Functional	Like	Q	A	A	A	O
	Must be	R	I	I	I	M
	Neutral	R	I	I	I	M

	Live With	R	I	I	I	M
	Dislike	R	R	R	R	Q

Description:
Q: *Questionable*
R: *Reverse*
A: *Attractive*
I: *Indifferent*
O: *One dimensional*
M: *Must-Be*

Step 3: process the results of the questionnaire answers using Blauth's formula, with the following conditions:

a. If the total value (one dimensional + attractive + must be) > the total value (indifferent + reverse + questionable), then the grade is obtained with the maximum value of (one dimensional, attractive, must be).
b. If the total value (one dimensional + attractive + must be) < the number of values (indifferent + reverse + questionable), then the grade obtained is the maximum of (indifferent, reverse, questionable).
c. If the total value (one dimensional + attractive + must be) = the total value (indifferent + reverse + questionable), then the grade obtained is the maximum among all the kano categories, namely (one dimensional, attractive, must be, indifferent, reverse, questionable).

Step 4: analyze the results of the process
The steps are carried out by positioning each question attribute. To position, it takes an average of the satisfaction and dissatisfaction of each attribute.

The level of satisfaction and level of disappointment from the Kano model can be determined by using better and worse calculations. The formula for calculating the average for each attribute is shown in formulas (1) and (2).

$$\text{Extent of satisfaction} \quad \frac{A+O}{A+O+M+I} \tag{1}$$

$$\text{Extent of Dissatisfaction} \quad \frac{O+M}{(A+O+M+I)(-1)} \tag{2}$$

Description :
A: *Atrractive*
O: *One dimensional*
M: *Must-Be*
I: *Indifferent*

Based on the average results it can be seen that the value allows knowing the attributes that become customer satisfaction and customer dissatisfaction. Attributes that are positive are maintained while negative ones are corrected.

2.4. Importance and Performance Analysis

At this stage, testing of the developed KMS was carried out. Tests are carried out from two sides, namely testing the decrease in the value of the knowledge gap and testing the quality of the software. The method used to measure the value of the knowledge gap is Importance and Performance Analysis (IPA). The analysis is carried out by filling in the current level and the level of needs. This filling is done by giving a value at the current level of mastery and the level of importance [19] which can be seen in table 3.

Table 3. Scoring In Gap Analysis

Knowledge Area	Mastery Level					Level of Importance				
Sub System 1……	1	2	3	4	5	1	2	3	4	5

Table 4 shows the scale used with an ordinal scale of 1-5.

Table 4. Scale In Gap Analysis

1	2	3	4	5
Not impotant / not mastered	Less important / not sufficiently mastered	Quite important / sufficiently mastered	Important / mastered	Very important / very master

After the questionnaires have been collected, the data is processed by calculating the average level of interest and the average level of mastery of the knowledge needed by employees. The equation for calculating the importance value for each required knowledge can be seen in equation (3) [20]:

$$NKi = \frac{(K_1 \times 1) + (K_2 \times 2) + (K_3 \times 3) + (K_4 \times 4)}{R} \quad (3)$$

Description :
NKi = Value of importance to knowledge i
K1 = Number of respondents answer A
K2 = Number of respondents answer B
K3 = Number of respondents answer C
K4 = Number of respondents answer D
R = Total Respondents

Equation (4) is the formula used to calculate mastery scores for each required knowledge [21]:

$$NPi = \frac{(P_1 \times 1) + (P_2 \times 2) + (P_3 \times 3) + (P_4 \times 4)}{R} \quad (4)$$

Description :
Npi = Value of mastery of knowledge i
P1 = Number of respondents with answer A
P2 = Number of respondents with answer B
P3 = Number of responses with answer C
P4 = Number of respondents with answer D
R = Total Respondents

Needs and current assessment uses a scale of 1 to 5 and knowledge gaps for each variable are obtained by calculating the average gap of the respondents. In order to be able to carry out a gap analysis between effective conditions and future interests, the following provisions are used:
0 : Very Small
1 : Small
2 : Moderate
3: Big
4 : Very Big

3. RESEARCH METHOD

This study uses a type of quantitative research. The research instrument used in quantitative research is a questionnaire [22]. Figure 3. displays the research stages used in this study. The initial stage of this research is to identify the problems and formulate the problems faced by the Student department. The next step is to review the study or literature review of the documents owned by the student department. In this study, researchers used two types of data, namely primary data and secondary data. Primary data were obtained from direct observations of student department and also interviews with office holders within the scope of student department. The next step after the literature study is to analyze the feature requirements of the KMS to be developed. Analysis of functional and non-functional requirements Using use case diagrams for modeling system functional requirements. After obtaining the feature list, the next step is to distribute the kano questionnaire to find out the level of importance of each of the proposed features. KMS was then developed using HTML and PHP by considering feature priority based on the results of the Kano questionnaire. The final stage after implementing the next system is to carry out tests using the Importance and Performance Analysis method. Tests with the IPA method were carried out twice, namely before the existence of the system and after the existence of the system, to measure the value of reducing the knowledge gap that occurred before and after the existence of the system. System testing is done by distributing questionnaires to KMS users that are developed.

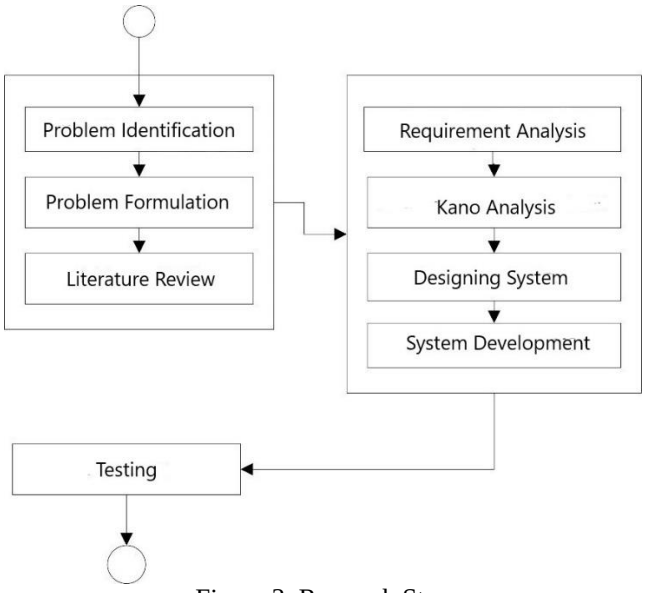

Figure 3. Research Step

4. RESULTS AND DISCUSSION

4.1. Requirement Analysis

The first step is to do a feature requirements analysis first to get what features the system needs. Table 5 describes the list of proposed features. The list of feature requirements was obtained through interviews with the head of the student. The list of feature requirements is then formulated into a list of knowledge document requirements by including all knowledge documents owned by the Student department as presented in table 6 and table 7.

Table 5. List Of Proposed Features

Num	Feature Type	Feature Name	Description
1.	Chatting Room	Chatting Room	This feature is provided for employees so that they can exchange ideas with other employees in the context of forming new knowledge and or sharing knowledge.
2.	Info	SOP	This feature contains a collection of Standard Operating Procedures. Employees can add, edit and delete documents.
		Student Statistic	This feature contains statistical information about students. Starting from the number of new students from year to year, the number of students for each study program from year to year
		Student department Data	This feature contains information on the list of UKM under the auspices of the student department.
		Tracer Study	This feature provides a form that graduates must fill out.

4.2. Analysis of Kano Questionnaire Results

After obtaining the feature requirements of the knowledge management system to be developed, the next step that must be taken is to analyze the results of the Kano questionnaire. Kano questionnaires were distributed as many as 6 questionnaires according to the number of respondents involved in this study. The respondents of this study were employees in the student department. Table 6 presents the results of the functional questionnaire.

Table 6. Functional Questionnaire Results

Num.	Functional	Like	Must be	Neutral	Life With	Dislike
1	contains the vision and mission of the organization;	1	4	1	0	0
2	contains a list of SMEs	1	3	2	0	0
3	contains SOP for the implementation of activities	1	3	2	0	0
4	contains SOP research request	1	0	3	0	2
5	contains employee information	1	0	5	0	0
6	contains student data	0	1	3	0	2
7	contains the SOP of the staffing section	0	0	0	4	2
8	contains the SOP admission of new students	2	4	0	0	0
9	contains the number of students	1	0	4	1	0

10	contains guidance and counseling SOPs	1	0	2	2	1
11	contains graduation registration SOP	2	4	0	0	0
12	contains SOP for final project guidance	1	0	3	2	0
13	contains SOP for school visits	0	0	1	4	1
14	contains the SOP for the final assignment exam	0	1	3	2	0
15	contains SOP for taking a diploma	2	3	1	0	0
16	contains the scholarship acceptance SOP	1	3	2	0	0
17	contains SOP for tracking graduates (tracer study)	1	5	0	0	0

In addition to distributing functional questionnaires, researchers also distributed dysfunctional questionnaires. Table 7 presents data on the results of the recap from the dysfunctional questionnaire with the same number of respondents as the functional questionnaire.

Table 7. Disfunctional Questionnaire Results

No	Disfunctional	Like	Must be	Neutral	Life With	Dislike
1	Doesn't contains the vision and mission of the organization;	0	0	1	1	4
2	Doesn't contains a list of SMEs	0	0	3	0	3
3	Doesn't contains SOP for the implementation of activities	0	0	1	2	3
4	Doesn't contains SOP research request	1	0	3	2	0
5	Doesn't contains employee information	0	0	1	1	4
6	Doesn't contains student data	2	0	2	2	0
7	Doesn't contains the SOP of the staffing section	3	3	0	0	0
8	Doesn't contains the SOP admission of new students	0	0	0	3	3
9	Doesn't contains the number of students	3	1	2	0	0
10	Doesn't contains guidance and counseling SOPs	1	2	2	1	0
11	Doesn't contains graduation registration SOP	0	0	1	0	5
12	Doesn't contains SOP for final project guidance	2	0	2	2	0
13	Doesn't contains SOP for school visits	3	2	1	0	0
14	Doesn't contains the SOP for the final assignment exam	0	0	1	3	2
15	Doesn't contains SOP for taking a diploma	0	0	0	3	3
16	Doesn't contains the scholarship acceptance SOP	0	0	1	2	3
17	Doesn't contains SOP for tracking graduates (tracer study)	0	0	0	2	4

Table 7 displays the recapitulation data and analysis results from the functional and dysfunctional questionnaires. The values in table 7 are obtained by calculating the respective M, O, A, I, R and Q values as shown in table 2. An example of how to translate the stages in table 2 is as follows:

1. If functional like meets dysfunctional like then the attribute value is Q (Questionable)
2. If functional like meets dysfunctional must be then the attribute value is M (must be)
3. If functional like meets dysfunctional neutral, then the attribute value is A (attractive)
4. If functional like meets dysfunctional live with then the attribute value is A (attractive)

The results of the tabulation of the level of respondents' desire for attribute variables are as follows:

1. Load Organizational Vision and Mission » Must be
2. Loading UKM List » Must be
3. Contains SOP for Implementation of Activities » Must be
4. Contains SOP for research request » indifferent
5. Loading Employee Information » Must be
6. Contains student data » reverse
7. Contains SOP for staffing » reverse
8. Loading About SOP Admission of New Students » Must be
9. Loading the number of students » indifferent document
10. Contains guidance and counseling SOP » indifferent

11. Load Graduation Registration SOP » Must be
12. Loading ta guidance SOP -> indifferent
13. Contains SOP for school visits » indifferent
14. Loading SOP test ta »indifferent
15. Load SOP for Diploma Retrieval » Must be
16. Load SOP for Scholarship Acceptance » Must be
17. Loading graduates Tracking SOP (Tracer Study) » Must be

Table 8. Tabulation Of Survey

Fuctionality	M	O	A	I	R	Q	Total	O+A+M	I+R+Q	Category
1	4	0	1	1	0	0	6	5	1	M
2	3	0	1	2	0	0	6	4	2	M
3	3	0	1	2	0	0	6	4	2	M
4	1	0	1	4	0	0	6	2	4	I
5	4	0	1	1	0	0	6	5	1	M
6	0	0	0	2	4	0	6	0	6	R
7	0	0	0	1	5	0	6	0	6	R
8	3	0	2	1	0	0	6	5	1	M
9	0	0	0	3	2	1	6	0	6	I
10	0	0	0	4	1	1	6	0	6	I
11	4	1	1	0	0	0	6	6	0	M
12	0	0	0	4	1	1	6	0	6	I
13	0	0	0	4	2	0	6	0	6	I
14	2	0	0	4	0	0	6	2	4	I
15	3	0	2	1	0	0	6	5	1	M
16	3	0	1	2	0	0	6	4	2	M
17	4	0	1	1	0	0	6	5	1	M

4.3. System Design Using UML

The results of the feature requirements analysis are then formulated in the form of a system model design using UML. feature requirements using obtained data To complement the KMS Student department researchers add basic features such as homepages, profiles, galleries and contacts. The addition of basic features to the system is carried out by researchers on consideration of providing a good user experience for users. In general, the modeling of the system to be developed can be seen in Figure 5. All users with various access rights have the same access restrictions and can access all menus in the system being developed.

Processing of this tabulation resulted in the conclusion that more than half of the attribute variables, namely with a percentage of 53% above, were absolutely desired by consumers, such as vision and mission, list of UKM, SOP for implementing UKM activities, employee information, SOP for new student admissions, SOP for graduation registration, SOP for taking diplomas, SOP for receiving scholarships and SOP for tracking graduates.

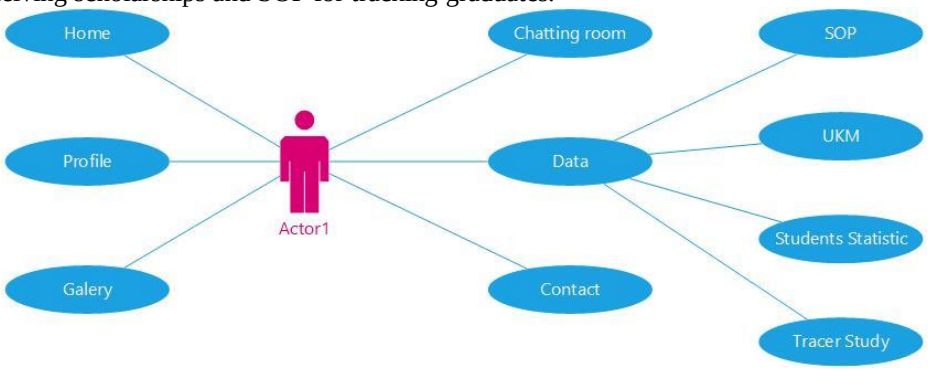

Figure 4. Use Case User

In the figure 4 it can be seen that the system being developed has 5 main menus namely menus home, profile, galery, chatting room, data and contact. The home menu is the initial page that is presented to the user when accessing the system for the first time, then there is a profile page that contains information about the student department. On the gallery menu contains photos of activities carried out by the student department. Then there is a chat room menu that allows employees to interact with one another. The next one there is a data menu with 4 sub menus namely SOP, UKM, student statistics, and tracer study. The last menu is the contact menu which displays a list of related contacts that can be contacted

4.4. System Design Implementation

The following is a display of KMS student created using HTML and PHP programming languages.

1. Chat room feature (Socialization)

The chat feature in Figure 5 is one of the features in the developed KMS. This feature can be used as a media for discussion and coordination between employees

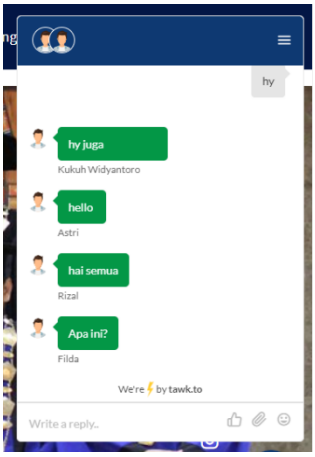

Figure 5. Chat Room Feature

2. Work collaboration menu page

The Collaboration feature in Figure 6 is a feature that allows collaboration between employees at the same time or taking turns to compile knowledge documents.

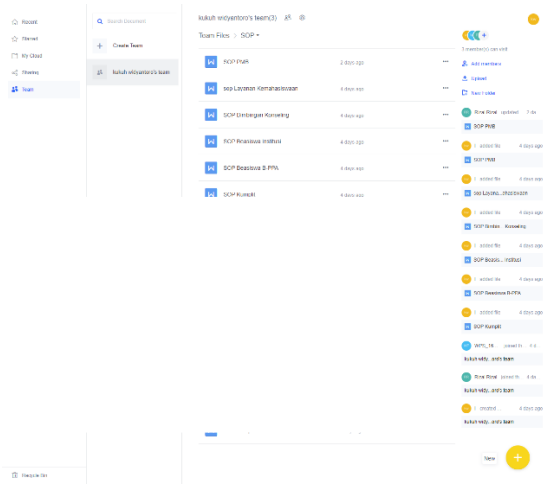

Figure 6. Collaboration Page

3. Document Edit Page Display

Document editing is of course one of the features that this KMS feature must provide. As shown in Figure 7, employees can edit documents that have been uploaded to the system.

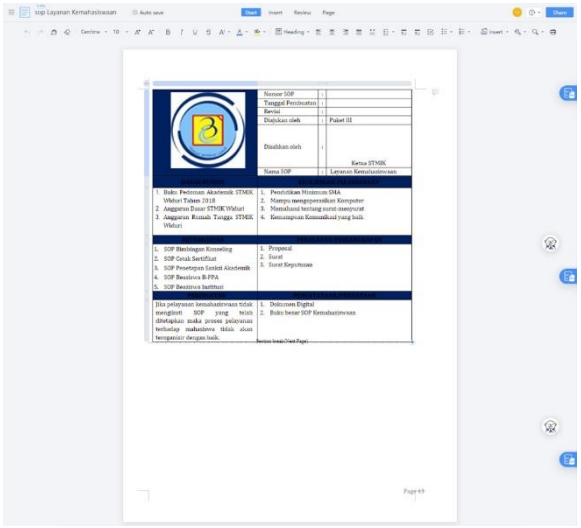

Figure 7. Document Edit Page

4.5. K-Gap Testing

1. K-Gap Value Before KMS Exists

The k-gap reduction test was carried out using the IPA method. The questionnaire format refers to table 3. The pre-research questionnaire was distributed before the system was developed, the aim was to determine the level of mastery of the respondents on the knowledge attributes. The questionnaire was distributed to 6 employees within the Student department. The results of the questionnaire can be seen in table 8 below.

Table 9. K-Gap Value Before KMS Exists

No	Knowledge Area	Mastery Level						Level of importance						Gap
		1	2	3	4	5	NPi	1	2	3	4	5	NKi	NKi-NPi
1.	the vision and mission of the organization;	0	4	2	0	0	2.33	0	0	0	1	5	4.83	2.50
2.	list of SMEs	0	1	5	0	0	2.83	0	0	0	2	3	3.83	1.00
3.	SOP for the implementation of activities	3	3	0	0	0	1.50	0	0	0	1	5	4.83	3.33
4.	SOP research request	3	1	2	0	0	1.83	0	0	1	0	5	4.67	2.84
5.	employee information	1	2	3	0	0	2.33	0	0	0	1	5	4.83	2.50
6.	student data	3	1	2	0	0	1.83	0	0	1	0	5	4.67	2.84
7.	the SOP of the staffing section	4	0	2	0	0	1.67	0	0	0	2	4	4.67	3.00
8.	the SOP admission of new students	0	4	1	1	0	2.50	0	1	0	0	5	4.50	2.00
9.	the number of students	0	5	0	1	0	2.33	0	0	0	3	3	4.50	2.17
10.	guidance and counseling SOPs	1	1	4	0	0	2.50	0	0	1	1	4	4.50	2.00
11.	graduation registration SOP	0	2	4	0	0	2.33	0	0	0	2	4	4.67	2.34
12.	SOP for final project guidance	0	3	3	0	0	2.50	0	0	0	3	3	4.50	2.00
13.	SOP for school visits	1	1	3	1	0	2.67	0	0	0	2	4	4.67	2.00
14.	the SOP for the final assignment exam	1	2	3	0	0	2.33	0	0	0	2	4	4.67	2.34
15.	SOP for taking a diploma	1	3	2	0	0	2.17	0	0	1	0	5	4.67	2.50
16.	the scholarship acceptance SOP	0	2	3	1	0	2.83	0	0	1	2	3	4.33	1.50
17.	SOP for tracking graduates (tracer study)	1	3	2	0	0	2.17	0	0	2	0	4	4.33	2.16
	Gap average													2.30

2. K-Gap Value After KMS Development

Before carrying out the second stage of testing, namely testing after KMS development, users are given the opportunity to use the system for 2 months. After 2 months of using the system, the user is again asked to fill out a questionnaire with the same variables in the questionnaire before the KMS was developed. The question format and questionnaire form used refer to table 3. Basically, users are again asked to fill in their level of knowledge of the knowledge attributes after the KMS system was introduced.

Based on the results of the analysis in table 8 and table 9, it was found that the knowledge gap (K-Gap) decreased by 1.63 points. This result is obtained by reducing the gap before the KMS, which is 2.30 points, with the Gap value after the KMS, which is 0.67 points.

Table 10. K-Gap Value After KMS Development

No	Knowledge Area	1	2	3	4	5	NPi	1	2	3	4	5	Nki	NKi-NPi
1.	the vision and mission of the organization;	0	0	2	2	2	4,00	0	0	0	1	5	4,83	0,83
2.	list of SMEs	0	0	4	2	0	3,33	0	0	0	2	3	3,83	0,50
3.	SOP for the implementation of activities	0	0	2	2	2	4,00	0	0	0	1	5	4,83	0,83
4.	SOP research request	0	1	2	3	0	3,33	0	0	1	0	5	4,67	1,33
5.	employee information	0	0	5	1	0	3,17	0	0	0	1	5	4,83	1,67
6.	student data	0	0	2	3	1	3,83	0	0	1	0	5	4,67	0,83
7.	the SOP of the staffing section	0	0	1	4	1	4,00	0	0	0	2	4	4,67	0,67
8.	the SOP admission of new students	0	0	1	4	1	4,00	0	1	0	0	5	4,50	0,50
9.	the number of students	0	0	3	1	2	3,83	0	0	0	3	3	4,50	0,67
10.	guidance and counseling SOPs	0	0	2	0	4	4,33	0	0	1	1	4	4,50	0,17
11.	graduation registration SOP	0	0	2	0	4	4,33	0	0	0	2	4	4,67	0,33
12.	SOP for final project guidance	0	0	0	0	6	5,00	0	0	0	3	3	4,50	0,50
13.	SOP for school visits	0	0	1	1	4	4,50	0	0	0	2	4	4,67	0,17
14.	the SOP for the final assignment exam	0	1	4	1	0	3,00	0	0	0	2	4	4,67	1,67
15.	SOP for taking a diploma	0	0	0	4	2	4,33	0	0	1	0	5	4,67	0,33
16.	the scholarship acceptance SOP	0	0	0	2	4	4,67	0	0	1	2	3	4,33	0,33
17.	SOP for tracking graduates (tracer study)	0	2	4	0	0	2,67	0	0	2	0	4	4,33	1,67
	gap Average 0.67													

5. CONCLUSION

The web-based knowledge management system or KMS developed using the Kano method has fulfilled its development objective, which is to reduce the value of the knowledge gap. The difference in knowledge gap test before and after the existence of KMS with the IPA method showed that there was a reduction in the knowledge gap by 1.63 points. The weakness of this research is that the research scope is quite narrow, namely only in one higher education department. With this research, academics can use the research results as a reference for similar research and can further develop further research. Efforts to increase research related to KMS development can be carried out by expanding the scope of research such as not only becoming a knowledge management system for student department but also for other departments within the scope of higher education. In addition, future researchers can also carry out comparative studies in terms of features that can be further developed so that they can accommodate all user needs, because it is possible that in the future the feature requirements of student department will continue to grow.

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