

Analysis of Knowledge Gap Value Using the Importance and Performance Analysis Method on the Adaptation of Tiwana Framework

Ahmad Taufik
Information System Department
STMIK Widuri
Jakarta, Indonesia
Ahmadtaufik2108@gmail.com

Suwaebatul Aslamiyah
Information System Department
STMIK Widuri
Jakarta, Indonesia
aslamiyart@gmail.com

Abstract— The knowledge gap (K-Gap) between the knowledge that a company should have for the knowledge it actually has is a problem in knowledge management that is normally faced by every company. Because of this, it was deemed necessary to create a Knowledge Management System (KMS). The purpose of this study is to analyze the value of Knowledge Gaps after the presence of KMS, and to determine the importance of knowledge attributes based on user perceptions. As an object of a case study that will be used in research, researchers use the Student Affairs Unit of a tertiary institution. The method used in the study is Importance and Performance Analysis (IPA) to analyze gaps and use the adaptation of the Tiwana model framework to develop KMS. The results of this study are a student unit's Knowledge Management System as well as suggestions for actions that can be taken by student units on each attribute of knowledge in order to improve student unit performance.

Keywords: *Knowledge gap, Knowledge Management System, Tiwana Model, Importance and Performance Analysis*

I. INTRODUCTION

The knowledge gap between the required knowledge and the knowledge possessed is a problem that is experienced by many companies. This affects employee performance because it is not well identified with the knowledge needs of a company, and it is not known which attributes of knowledge should be improved or should be eliminated. In connection with these problems the researchers designed the Knowledge Management System to use the adaptation of the Tiwana framework to analyze changes in the gap values after and before the KMS. The results of the KMS that are built are expected to reduce the knowledge gap and help the company in making decisions related to knowledge attributes that are deemed necessary or unnecessary to be mastered by employees of the company. As a sample of research researchers used the Student Unit of a college. The reason researchers use the Tiwana framework for adaptation is because Tiwana has advantages compared to other KM design methods. The advantage of Tiwana's framework is that it has clear stages in KM design, starting

from the analysis of existing infrastructure to the evaluation phase of the KM being built. While the use of the IPA method is motivated by the ease of use as well as the appearance of analysis results that facilitate the proposed improvement.

II. LITERATURE REVIEW

Wahyuni (2010) in a study entitled "Knowledge Gap Analysis between Employees and Managers of North Bandung Cattle Breeders Cooperatives (KPSBU)" has the objective to identify the resources available at KPSBU and analyze the knowledge expected by KPSBU to be owned by employees and manager. The analytical method used in this study is KM Zack Model Knowledge Analysis and Knowledge Gap Analysis (KGap). The results showed that the KPSBU knowledge source consisted of three sources namely employee competence, internal structure, and external structure. The knowledge that KPSBU expects to be mastered by 17 employees and managers is a shared vision, conversation manager, mobilization of knowledge drivers, provision of a conducive environment, dissemination of internal knowledge, company knowledge, and knowledge creation. There is a knowledge gap between the level of importance of knowledge and the level of mastery of knowledge in KPSBU. From the results of data management, it can be seen that the knowledge about shared vision has the highest K-Gap, which is 0.646, which means that knowledge about shared vision has a high level of importance but employees have a low level of mastery. The lowest result of KPSBU data management is the provision of a conducive environment with a value of -0.521 which means it has a low level of importance and employees have a high level of mastery.

Safriadi, Salam and Hazriani (2015) conducted a study entitled "Wikipeat as the Implementation of Knowledge Management System (KMS) for the Management of Research Results at Tanjungpura University". This research was conducted using the SECI method. The result of this research is an application called WikiPeat. WikiPeat can map the results of lecturers' research, collect and recycle

structured knowledge. organizing and documenting knowledge, especially in the field of tropical wetlands and peatlands, aggregating documents of research results based on PIP and RIP, and compiling and linking external science sources. In the future, Untan still needs to encourage all lecturers and researchers, even involving all parties to increase knowledge gathering in other fields, so that it can indirectly improve the quality of Untan.

Mutia, et al (2017) conducted research with the title "Designing Knowledge Management System (KMS) 2013 Curriculum Using the Tiwana and Zack Models". This research aims to contribute to enrich the long-term implementation of the 2013 Curriculum Knowledge Management System (KMS) in High Schools Negeri (SMAN). This research uses a qualitative research method type of case studies with the framework of the Amrit Tiwana model and knowledge mapping using the Zack KM cycle model. Data collection techniques used in this study were questionnaires, interviews, and observations. In an effort to obtain research data that can be justified or valid, the analysis and research design stage with an object-oriented approach with UML, while the system design includes database design, system architecture and KMS interface. The results of this study are in the form of good quality KMS design with main features : teacher data input, subjects, discussion forums, loading and downloading files, and searching for files according to the 2013 curriculum.

Herlinda (2017) conducted a study with the title "KMS Web Prototype at the University as a Means of Communication of Lecturers with the Tiwana Framework". Research conducted using qualitative methods of case study type, with the concept of the Amrit Tiwana framework model, tested with FGD and ISO 9126 models (functionality, reliability, usability, and efficiency). Output in the form of a web-based prototype of Knowledge Management System (KMS) main features lecturer data input, course input, discussion forums, loading / downloading files, searching files.

III. METHODOLOGY

A. Tiwana Framework Adaptation

After making some adjustments, the steps in the Tiwana method used are as follows:

1. Analysis of Existing Infrastructure
At this step what needs to be done is to analyze the existing infrastructure, then identify the concrete steps to build the KM platform.
2. Aligning Knowledge Management and Business Strategy
At this step what needs to be done is to analyze the alignment between knowledge management strategies and business strategies.
3. Design the Knowledge Management Infrastructure

4. What needs to be done at this step is designing infrastructure which is the architecture of the knowledge management system.
5. Create the Knowledge Management Blueprint
You have to make knowledge management blueprint at this step. Knowledge management blueprint provide a plan for building and gradually improving the knowledge management system.
6. Develop the Knowledge Management System
At this step the KMS development starts, starting from the interface, access rights, database, etc.
7. Deploy, Using the Result-driven Incremental Methodology
This step is the distribution of the KM system that was built in the previous step.
8. Evaluation Performance, Measure ROI and Incrementally Refine The KMS
At this step what is done is to evaluate the performance, measure Returns-on-Investment (ROI) and gradually improve the knowledge management system.

A. Importance and Performance Analysis

Importance Performace Analysis (IPA) is a method for mapping the level of importance particular performance of a product. Then the level of importance is mapped in a Cartesian diagram called IPA Matrix¹.



Figure 3: Matriks IPA

After the questionnaire has been collected, the data will be processed by calculating the average level of importance and the average level of mastery of the required knowledge. The formula for calculating the importance value for each required knowledge² is as follows:

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

Explanation

NKi= the importance value of knowledge i

K1 = number of respondents with answers A

K2 = number of respondents with answers B

K3 = number of respondents with answers C
 K4 = number of respondents with answers D
 R = Total Respondents

The formula for calculating mastery value for each knowledge is as follows :

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

Explanation :

NP_i = the mastery value of knowledge i
 P1 = number of respondents with answers A
 P2 = number of respondents with answers B
 P3 = number of respondents with answers C
 P4 = number of respondents with answers D
 R = Total Respondents

The knowledge gap is obtained from the difference value between current mastery and the value of interest in each variable of the determinant dimensions of knowledge area. The assessment of the importance and mastery of knowledge uses a scale from 1 to 5.

To analyze the gap between effective conditions and interests in the future³ the following table is used:

Table 1: The value of gap scale

0	1	2	3	4
So small	Small	Middle	Large	So Large

IV. RESULT AND DISCUSSION

A. Analysis Existing Infrastructure

In carrying out the analysis of existing infrastructure, the researcher divides it into 2 parts: the existing information technology infrastructure and the existing knowledge sharing culture. STMIK Widuri Student Unit does not have their own internet network, but is incorporated in the STMIK Widuri internet network in general that is connected to each computer within the scope of the STMIK Widuri without exception the Student Unit.

Knowledge sharing culture in student units has also been existing, but the implementation is not maximal and effective yet. The weakness of the existing knowledge sharing culture is the process of sharing knowledge is only done if the new employee require certain information, or only done through sharing knowledge documents, meaning that there is no structured and continuous process of sharing knowledge that causes the knowledge sharing process to be hampered and the involvement of previous position holders is still continuing

B. Align Knowledge Management And Business Strategy

The organization's business strategy includes the organization's vision and mission, are the programs and steps taken by an organization in achieving its objectives.

The vision and mission of STMIK Widuri student unit are:

- a. Vision
To become an excellence center in developing academically-professionally and personally-competitive student affairs.
- b. Mision
 - 1) Building the value of excellence personality, such as: honest, confident, resilient and creative through integrated and planned student activities.
 - 2) Develop students' interests and talents in Technology and Information field to build the reputation of college.
 - 3) Providing maximum service and assistance to students in achieving excellence.
 - 4) Build a strong alumni organization and network as partners in developing tertiary institutions

After the elaboration of the organization's business strategy, knowledge strategies that must be met by the student unit's knowledge management system is KMS student unit must ensure the process of creation, transfer, storage and application of knowledge to the knowledge attributes below are met :

- 1) Vision and mission of the organization
- 2) list of student affairs units
- 3) Standard operational procedures for implementing student affairs units.
- 4) Standard operational procedures for research request
- 5) Employee information
- 6) Student Information
- 7) Standard operational procedures for employee
- 8) Standar operational procedures for new student recruitment
- 9) Data of active students
- 10) Standard operational procedures for guidance and counseling
- 11) Standard operational procedures for graduation registration
- 12) Standard operational procedures for thesis guidance
- 13) Standar opearational procedures for school visit.
- 14) Standard operational procedures for thesis examination
- 15) Standard operational procedures for taking diploma sheets
- 16) Standar operational procedures for granting foundation scholarships and BPPA-BPM Scholarship

17) Standar operational procedures for tracer study

C. Design The Knowledge Management Infrastructure

a. Feature Requirements Analysis

After aligning the organization's business strategy with the KM strategy, the next strategy is to formulate the KM strategy which will be used as the basis for designing KM infrastructure.

Table 3:The problem solution

No	Fitur	Description
1	Chat room	A chat room is needed inside the KMS to facilitate the electronic discussion process.
2	Activity Proposal	This feature contains student activity unit activity proposals that allow employees to add, subtract or change activity proposals.
3	Activity report	This feature contains accountability reports of activities carried out by student activity units and allows employees to add, subtract or change activity proposals.
4	SOP	This feature contains a set of Standard Operating Procedures related to Student Affairs. Where employees can do the process of adding, editing and deleting documents.
5	Meeting notes	This feature contains a collection of minutes from each meeting
6	Student Statistical	This feature contains student statistical information. Starting from the number of new students from year to year, the number of students per study program from year to year.
7	Student activity Unit List	This feature contains information about the list of student activity units under the guidance of student units.
8	Tracer Study	This is a fitur who provide a formulir for the alumni.

b. Knowledge Management Infrastructure Design



Figure 5:KM infrastructure design

D. Design The Knowledge Management Team

The design of Knowledge Management System team is tailored to the existing user. There are two levels of user accessibility in this KMS, administrators and ordinary users. The KMS management team consists of:

1. One person acts as the administrator who responsible for managing user data, knowledge, and content from KMS.
2. Third chairman's aide and all employee at student unit as a user of KMS.

E. Create The Knowledge Management Blueprint

what is done at this stage is to create a knowledge management blueprint that provides a plan to build a knowledge management system and improve it gradually. Blueprints that used in this study can be seen in the following figure:



Figure 7:KM Blueprint

F. Develop The Knowledge Management System



Figure 8:KMS Homepage

G. Deploy, Using the Result-driven Incremental Methodology

After the student unit's knowledge management system system has been developed, the next step is to distribute KM to the employees to get feedback from users about the system being developed.

H. Evaluation Performance Of The KMS

1. Knowledge Gap Testing Result

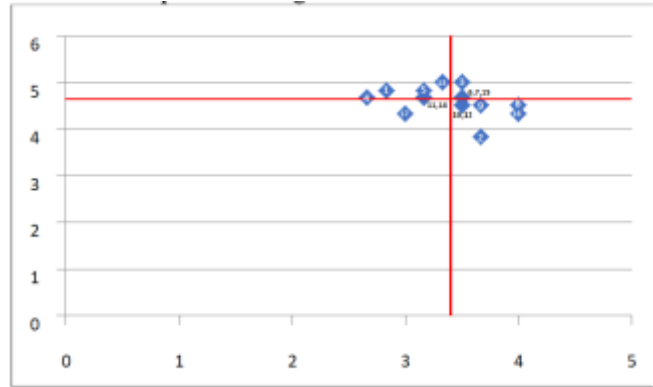
Measurement of the gap value was tested before and after the existence of KMS student units using the Importance and Performance Analysis method. Testing involved a number of 6 respondents.

Table 6: Value comparison of K-Gap

No.	Knowledge attribute	Gap before	Gap after
1	Vision and mision	2.50	2.00
2	Employee information	1.00	0.16
3	List of student affairs unit	1.67	1.50
4	Data of active student	2.84	2.00
5	SOP for employee	2.50	1.66
6	SOP for granting foundation scholarship	2.84	1.17
7	SOP for granting BPPA-BPM Scholarship	3.00	1.17
8	SOP for guidance and counseling	2.00	0.50
9	SOP Pelaksanaan kegiatan UKM	2.17	0.83
10	SOP for new student recruitment	2.00	1.00
11	SOP for school visit	2.34	1.50
12	SOP for graduation registration	2.00	1.00
13	SOP for thesis examination	2.00	1.67
14	SOP for tracer study	2.34	1.50
15	SOP for thesis guidance	2.50	1.17
16	SOP for taking diploma sheets	1.50	0.33
17	SOP for research request	2.16	1.33
Gap average		2.20	1.21
Impairment of the K-Gap		0.99	

I. Proposed improvement to Knowledge requirements

The proposal for the knowledge needs of the STMIK Thistle student unit was obtained after formulating the test results into a science matrix. For more details can be seen in the following graph:



Quadrant I shows attributes that are considered very important but have not shown good performance. These attributes are attributes 1, 4, 5,11, 13 and 14.

Quadrant II shows attributes that are considered important and have been implemented very well by employees in accordance with company expectations. Attributes that are in this quadrant should be maintained and further enhanced. Attributes contained in this quadrant include attributes number 3, 6, 7 and 15.

Quadrant III shows attributes that are considered less important and are considered to be poor mastery of employees so that the attributes in this quadrant should be considered whether or not to improve. The attribute in this quadrant is attribute number 17.

Quadrant IV shows attributes that are considered less important but in practice they are considered to exceed expectations. Attributes that exist in this quadrant are attribute numbers 2, 8, 9, 10, 12, and 16

V. CONCLUSION

Based on the descriptions of the chapter above, some conclusions can be drawn, namely:

1. The development of the Knowledge management system using the tiwana framework in the STMIK Widuri student unit has gone through the process of reducing the knowledge gap value using the Importance and Performance Analysis method with the result of a decrease in the gap value of 0.99 points.
2. Based on the results of the analysis using the IPA method, it was obtained 6 attributes of knowledge that were considered important by respondents but did not show good performance (Quadrant I). This becomes the Home Task for the Student Unit to improve education or socialization to employees about the attributes of knowledge in the quadrant I.

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