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Measurement The Level Of The Knowledge Management System Implementation On People, Structure, Culture, And Technology Factor Using Analytical Hierarchy Process (AHP) Method At Telkom University

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Abstract

Knowledge management system required by Telkom University to create business value and generate competitive advantage continuously. Igracias is a knowledge management system that used in Telkom University. Igracias measurement is necessary for implementing of knowledge management system at telkom university can be an effective and efficient. Measurement of implementing knowledge management system has two stage. The first stage using Analytical Hierarchy Process (AHP), to see the weight of indicators priority of knowledge management system. The second stage is implementing knowledge management system was measured by Aydin and Tasci scale (2005). Based on measurement using greid klein matrix has show that the indicators used to measure tends to high impact, this means readiness indicators used have a major impact if it is not implemented. This research resulting the order of priority as culture, technology, people and structure. Aydin and Tasci scale (2005) concluded that Telkom university at second categories, which means not ready and still need some improvement.

Introduction

Knowledge management is the management of organizational knowledge to create business value and generate sustainable competitive advantage by optimization creating of the process, communicating, and application of all the knowledge that is needed in order to achieve business goals (Tiwana, A. 1999). Knowledge management is done by creating a knowledge management system. Knowledge management system has several functions such as creating a foundation for evaluating the organization, encouraging managers to focus on important things in the organization and aligning investments in any activities knowledge management. (Riadi, D. 2011) Some other benefits of KM implementation is the company did not lose knowledge because it is stored in the website, helped in conducting a competitive
competition by using effective KM, helped to solve the problem quickly, cost efficiency, helped in determining the strategy and the company performance improvement.

Igracias used to manage knowledge at telkom university. Igracias used by faculty, staff, and students of the Telkom University in academic activities. Some functions must be provided by a company in order the system can be considered as a knowledge management system (Tiwana, A. 1999). Igracias has not the following functions such as group discussion as knowledge creation process, video call, video streaming, and audio streaming to communicate of knowledge.

Implementation of knowledge management has four important factors, such as culture, structure, people, and technology. (Lee, H dan Choi, B. 2003) therefore, the implementation of knowledge management system is not enough to just have a system, but users of the system should also be considered so that the implementation of knowledge management system effectively. There are some problems in the igracias implementation as an effective knowledge management system. therefore it is necessary measurements to be effective Knowledge Management System.

Igracias has a number of problems to be an effective and efficient knowledge management system. First problem is the lack of trust between each other in the organization, because a lack of knowledge sharing process within an organization. second problem is Technology does not support KMS because of the standar infrastructure does not meet the required. The third, members of organization did not have good knowledge about KMS and operation KMS tools. And the last problem is hard to change company culture because employees have been familiar with old process (Darudiato, S., dan Suryadi, L. 2010)

Lecturers, faculty staff and academic support staff are involved in the assessment of the implementation igracias as a KMS at Telkom University. Their involvement aims to determine the highest priority of several indicators. Analytical hierarchy process method (AHP) is used to view the highest priority indicator, because it covers a wide variation factor and useful to evaluate and compare various alternatives. Analytical hierarchy process (AHP) is provides a rational basis for analysis by assigning weights for the factors to be considered in the selection of an alternative, such as quantitative factors and qualitative factors. In addition, the Analytical hierarchy process (AHP) is also changing a qualitative scale into quantitative scale. Further calculation is performed by using Aydin and Tasci scale (2005), its to see the implementation of knowledge management system using readiness indicators at Telkom university.

The first problem statement of this research is how the implementation of the indicators of the level of importance of Knowledge Management System (KMS) using readiness indicators on factors people, technology, culture, and structure at Telkom University by using Analytical Hierarchy Process (AHP) based on the opinions of faculty and staff. and the last problem statement is how the recommendation for the implementation of Knowledge Management System (KMS) at Telkom University.

The first purpose of this research is to identify the importance of implementation indicators knowledge management system (KMS) by using readiness indicators at Telkom university with Analytical hierarchy process (AHP) method based on the opinion of faculty and staff. second purposes is measuring the implementation level of the knowledge management system (KMS) at Telkom University using Aydin and Tasci scale, and the last purpose is to make recommendations for knowledge management system (KMS) implementation at Telkom university.

Research has limitations, such as it does not discuss about the readiness technically, this research only in the analysis stage , it was not until implementation, and in this research was not conducted a feasibility analysis on the implementation of KMS. Fist benefits of this
research for Telkom university is able to assist to determine KMS readiness scale based on culture, structure, people, and technology factors. Second benefits, it can help the Telkom university to know the interest KMS scale, so Telkom university can make improvement with consideration of the results of calculations using AHP, and the last benefit is provide solutions and strategies KMS readiness for the Telkom university.

Literature Review

Knowledge Management System (KMS)

Knowledge management system is a system used to manage the knowledge owned by a company to support the process of knowledge management in the company. Based on the research Lee and Choi (2003) there are four factors including the culture, structure, people, and technology support. Each factor breakdown into several dimensions. The culture factor has four dimensions as a leadership dimension, learning dimension, user trust dimension, and collaboration dimension. The structure factor consists of centralization and formalization. Furthermore, people factor derived be T-shaped skills and the Technology Support factor consists of IT Support.

This research also uses a reference from some previous research to find out more detail readiness, factors which would be a question for the respondents and experts. Several reference used to see more details of each factors (concept). Concept people using assessment indicators, such as organizational culture, leadership, work unit climate, motivation and task requirement individual skill and ability (Burke dan Litwin, 1992). The concept of process consists of the vision, mission, and strategy, management practices, policies and procedures (system) (Burke and Litwin, 1992). The concept of technology according to Lee and Choi (2003) has the indicators of IT support.

Analytical Hierarchy Process (AHP)

Analytical hierarchy process (AHP) methods developed by Saaty, a great matematika lecturer of Pittsburgh university. This method is a method to get the best solution from several alternative solutions by utilizing the "pairwise comparison" as a basis for determining the choice. This method is able to formulate the problem into a structured hierarchy and can easily solve unstructured complex, such as the problem of planning, determination of alternatives, prioritization, selection policies, resource allocation, determining needs, forecasting results, system design, measurement performance, and optimization.

Steps Using AHP

1. Define the problem and design goals
2. Formulate the problem in a hierarchical structure, which begins with a general purpose, followed by a special purpose, criteria and possible alternatives to the bottom.
3. Establish priorities for each element of the problem at the level of the hierarchy. Criteria and alternatives assessed through pairwise comparison matrix. According to Saaty, for a variety of problems, a scale of one to nine is the best scale to express an opinion. Table 1 Shows the value and qualitative idea of the scale of comparison Saaty (2008)

Table 1. The fundamental scale of absolute numbers
Aydin and Tasci Scale (2005)

Aydin and Tasci Scale (2005) is a scale to measure the level of readiness. This scale uses the data from the survey, then the data are inserted into the measurement process. Alternative answers are listed on the questionnaire data encoding, which is coded with a value of 1 to 5. After that, the expected level of readiness mapped to a scale of 1 to 5. Scale 1 means that these factors are not ready and scale 5 means the stated factors ready to run. Aydin and Tasci measurement scale can be seen in Figure 1.

![Figure 1: Readiness Indeks (Aydin dan Tasci, 2005)](image)

Research Methods

Conceptual model is used to get an overall picture of the problem in this research. Conceptual model of this research can be seen in Figure 2.
Figure 2: Conceptual Model

Figure 2 explained that Telkom University has Igracias as a Knowledge management system. Igracias is able to manage knowledge effectively and efficiently, it can increase the business value of Telkom University. In order to be effective and efficient, Igracias requires a thorough evaluation, especially factors (concept) people, culture, structure, and technology. A research begins with the identification of the problem by viewing KM at Telkom University. The next step is formulation of the problem and the purpose of the research. And then is determining of dimensions of research and will be translated into indicators of each dimension. Indicators were used as a questionnaire question. The questionnaire is filled by the Lecturers, faculty staffs, and academic support staffs at Telkom University, then analyzed to determine the results. The results of the analysis will be weighted by using Analytical hierarchy process method (AHP). Results of AHP method is the weight value of the consideration several factors (concepts). The results were analyzed using an Aydin and Tasci scale in order to obtain the level of KMS readiness at Telkom University. Then, the level of readiness of Aydin and Tasci scale is used for KMS readiness strategy planning that proposed for the Telkom University.

Data Collection

Number of Respondents questionnaire is determined by the amount of the actual population. The division of the sample as follows (Kaplan, R. M. dan Saccuzo. 1993):

1. The minimum sample is 30, if the sample size is less than 30, it is considered too small to determine conclusions
2. Size of sample is 10% percent of the population if more than five hundred population
3. Sample sizes are between 100-500 should be used for a population of five thousand
4. Sample of 200-1000 is used for more than 10,000 population

The number of respondents is 774 people consisting of 618 lecturers and faculty staff and 156 academic support staff at Telkom University. Figure 3 describes the percentage of the amount of each faculty and academic support staff at Telkom University.
Sample of respondents was 10% for the total population more than 500 so that 10% of 774 is 77.4 rounded to 78 respondents.

The average working period of the respondents can be describe as follow, that first largest percentage of respondents who working period is 1-5 years with a percentage of 50%, or as many as 39 people. The second largest percentage of respondents who work period no more than 1 year, as many as 26 people with the percentage of 33%. Furthermore, respondents with working period in a range of 5-10 years is 11 people with the percentage of 14%. Respondents who working period 5-10 year are not filled out questionnaire, and 3% repondents who working period more than 15 years. Respondent sample is dominated by working period range 1-5 that already understand about work cultural at Telkom university, especially in units of the respondents worked. In addition, respondents have understood the procedure for each activity at each unit

Data Analisys

Successive Interval

Successive Interval is the process to change the ordinal data into interval data. Ordinal data is qualitative data or not the actual numbers. Ordinal data using numbers as symbols of qualitative data. This research uses a scale of 1-6 as a scale for assessing KMS readiness indicators, so the questionnaire data is ordinal data that must be converted into interval data. successive interval proceses ordinal data of questionnaires into interval data

Validity And Reliability Test

Validity test function is to determine the validity of the questionnaire, which is used in the collection of data by looking at the correlation of each variable score of respondents with a total score of each variable. then the results were compared with the critical value at a significant level of 0.05 and 0.01. The level of validity indicates the extent of data collected does not deviate from the description of the variable in question. Cronbach alpha value of 0.3 used to be considered valid and 0.7 to be considered reliable. according to the data processing using SPSS software version 17.0, all variables (questionnaire) can be inferred valid and reliable.

KMS Readiness Indicator Value
At this stage, data processing results calculated average value with successive intervals. Table 2 shows the value of readiness for each concept.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Dimension Average</th>
<th>Concept Average</th>
<th>KMS Readiness Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>3.496</td>
<td>3.409</td>
<td>2.841</td>
</tr>
<tr>
<td></td>
<td>3.580</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.364</td>
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<td></td>
<td>3.375</td>
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<td></td>
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<tr>
<td></td>
<td>3.205</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.432</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>3.524</td>
<td>3.524</td>
<td>2.936</td>
</tr>
<tr>
<td>Culture</td>
<td>3.454</td>
<td>3.656</td>
<td>3.047</td>
</tr>
<tr>
<td></td>
<td>4.128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.797</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.573</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.102</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.883</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td>3.080</td>
<td>3.035</td>
<td>2.529</td>
</tr>
</tbody>
</table>

Table 2 shows the average value of each dimension. This got by calculating the average of each indicator of dimension. A Concept average value is calculated by averaging dimension values dimension at concept. Aydin and Tasci Scale (2005) has five scales, so that the readiness value of each concept are got by converting the average value of each concept into five scale KMS implementation. After the convention process to Aydin and Tasci scale (2005), the next step was weight value for each concept with AHP, it’s refers to the expert opinion at Telkom university.

The next step analysis process using greid klein matrix, that is used to compare respondents lecturers and staff with expert opinion. From figure 4 can be seen klein greid matrix for KMS readiness indicators in Telkom university. That shows V1, V2, V3 to V66 is an indicator that is used for the question. Figure 4 shows that the indicators are in the category of high impact very much. This means readiness indicators have a high impact if it is not implemented at Telkom university.
Measurement Aydin and Tasci scale (2005) is a scale that is used to see the level of KMS readiness at Telkom university. This readiness scale will be used as consideration to make a recommendation every concept. Aydin and Tasci scale (2005) has 5 scale, divided into 4 categories. The average value of each concept is converted to 5 scale, its because the questionnaire using the 6 scale, so it must be converted at Aydin and Tasci scale (2005). Table 2 can be inferred average value KMS Readiness is 2.896. At Figure 5 can be sow level knowledge management system.

Referring to Figure 5 average value of implementing knowledge management system at Telkom university is 2.863, it means at the second category, which is not ready, need some of work. It is still a long way to reach a value of 3.4, which was the ready level as expected (Aydin, C. H., dan Tasci, D. 2005).

Discussion
Telkom university should create the right strategy to reach the targeted level, it is 3.4 level (ready to work). Target creations should be focused on people, technology, culture and structure concepts.

There are several strategies for the concept of people, such as first strategy is training for employees at Telkom university so that employees and lecturers can improve skills and make knowledge sharing frequently. A second is giving the award to employees who often do sharing knowledge so that employees are more motivated to sharing knowledge. Another strategy is sharing knowledge as one of components for the performance appraisal.

There are three strategies that are used to the concept of technology. The first, is measuring the performance of information system at Telkom university, second strategy is to create a website that is devoted to knowledge management system, and the third strategy information technology staff should be a reliable person in information technology.

The strategy is given to the concept of culture is to make individual special knowledge record, so that if the individual is retired then his knowledge can be stored and can be used by other employees. Another strategy is to create a community of knowledge sharing, made a small group at the level of the unit or across units. This makes the community of employees, more open so that knowledge sharing can be implemented more easily. For dimensions of leadership can be improved with the leader of each unit gives an appreciation to employees for every knowledge sharing activity.

Strategies are made for the structure concept is creating a vision, mission, and knowledge management system strategy for Telkom university, then made a formal procedure for the implementation of knowledge management system guidelines. The last strategy is to create a special division to manage the knowledge management system.

Conclusions

From the results of data processing and analysis, it can be concluded as follows:

1. Readiness level implementation of knowledge management system, as measured by analytical hierarchy process (AHP) based on factors people, technology, culture, and structure, culture factor got a weighting of 30.480%, more important with people (25.835%), and more important than technology (25.763 %), and structure (17.921%).

2. The level of implementation of knowledge management system is reviewed by the measurement Aydin and Tasci scale (2005), which is based on people factors, technology factors, culture factors, and structure factors were categorized into second category, which means not ready, need some of work.

3. There are several recommendations for Telkom university, build knowledge management systems division, make a special website knowledge management system, gave awards for knowledge sharing, training for the creation of knowledge sharing, doing performance measurement regulary, recording knowledge regulary, create a community of knowledge management system, and establish procedures for the knowledge management system implementation.

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