Evaluation Of Knowledge Management System Using Technology Acceptance Model

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***Abstract*—This study was motivated to assess the Knowledge Management System (KMS) using Technology Acceptance Model (TAM). TAM is the best concept to be taken as model on explaining user attitude of new technology. TAM model used in the study because it has been widely adopted among IT researchers and appears to be growing rapidly, has the reliability and construct validity were established, and realized that the model has not been applied to the acceptance KMS. The data population in this study is the employees in PT. XYZ who have work-related to development and maintenance process. The data analysis was done using Partial Least Squares (PLS). The analysis was proof to be statistically significant: a) perceived ease of use and perceived usefulness, b) perceived ease of use and attitude, c) perceived usefulness and attitude, d) perceived usefulness and behavioral intention to use, e) behavioral intention to use and actual use.**

Keywords— Evaluation, Knowledge Management System; Technology Acceptance Model; Partial Least Square.

I. INTRODUCTION

The rapid development of science and technology makes highly competitive that forces to increase quality and capacity of human resources in a company / organization. The world has entered the era of knowledge economy, leaving the era of industrial economy where knowledge becomes a resource and learning become the most important and strategic abilities to the organization [1]. In order to develop human resources needed effort. Human resources is an intellectual company asset, with the implementation of knowledge management is expected to be evenly distribute knowledge of human resources.

Organizations need to encourage the creation of value in achieving a goal by applying tacit and explicit knowledge in business processes. Knowledge management (KM) is the process of creation of these values [2], which is then used as a method to achieve the goals and strategies of an organization in a way to innovate continuously [3].

Developing Software using proprietary framework forced the company to perform provisioning for each employee who recently joined the PT. XYZ. Each employee will be created an account to access the e-Learning contained in the Knowledge Management System (KMS). Employees will undergo a training process contained in the e-learning module for two weeks to one month, after that the employee is expected to understand basic concepts in using the framework of the company.

The weakness of using of proprietary frameworks is when the employee face a problem they cannot find solutions on the internet or commonly known as googling. This often occurs when making adjustments to customize the product or the business processes of the client, such as integration with web services or social media. The common ways that are usually taken by employees to resolve these issues are:

1. Employees will directly ask their senior within the same team and learn from them.
2. Using the mailing list (on e-mail) to discuss and find solutions to their problems.

It became concern to the company, some managers find a way like job shadowing and employees department rotation to share and transfer knowledge from one to another as the distribution of knowledge.

The problem can be seen that this KMS has not been used as the company's purpose to build the system, which is KMS as a container or repository of sharing information among employees. Employees should also be able to search the documentation about how to integrate and customize the product, they can take a series of advanced learning modules. KMS has also provided a forum for discussion, thus the

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particular problems and solutions can be recorded and retrievable by other users who have similar problems.

Research on user behavior in accepting KMS has been done by W. Money and T. George [4]. Money stated that the success of KMS is starting certainly with individual acceptance. The study tries to broaden understanding of the relationship between two important research topics of IT: user acceptance of IT and KM organization. Money using TAM model [5] as a framework to investigate the implementation of KMS in an organizational unit of the large private companies in the field of consulting and technical services. TAM model used in the study because it has been widely adopted among IT researchers and appears to be growing rapidly, has the reliability and construct validity were established, and realized that the model has not been applied to the acceptance KMS.

II. LITERATURE REVIEW

A. Knowledge Management System

Knowledge can be viewed in terms of conceptual as well as practical to narrow the scope to a broad scope. Knowledge is the process of translating information (such as data) and past experiences into a series of relationships that have meaning that is understood and applied by individuals [6]. Thus, knowledge is developed through the adaptation and interpretation of information, expertise, past experience, errors, and other influences. Knowledge is not just knowledge but knowledge is a mixture of experience, values, contextual information, expert views and fundamental intuitions that provide an environment and framework to evaluate and integrate new experiences with information [7].

According to Debowski [6], Tacit Knowledge is knowledge which describes the accumulation of experience and learning to someone and it is difficult to be reproduced or distributed to others. Although tacit knowledge is difficult to be documented, categorized, and divided, the organization relies on tacit knowledge to ensure good-quality of the choices and considerations. In the scope of work, many employees have a high level of tacit knowledge they have developed through experience, learning and investigation of existing resources. Barriers to translate this knowledge into a tangible product or process that poses two problems for the organization. Explicit Knowledge is knowledge that can be shared with others, can be documented, categorized, transmitted to others as information, and illustrated to others through demonstrations, explanations, and in other forms of sharing. Declarative knowledge is a set of principles and facts that can be explained to others, and procedural knowledge that allows the application of the process.

Knowledge conversion is explain that the fundamental reason why the Japanese company a success, because the skills and knowledge they are the creation of organizational knowledge [8]. The creation of knowledge is achieved through the introduction of synergistic relationship between tacit and explicit knowledge [9], knowledge management is a science that is looking for ways to improve the performance of both individuals and organizations to save and improve the current value and future value based knowledge assets. The mapping of Tacit and Explicit knowledge are shown in Figure 1.

	TACIT	EXPLICIT
TACIT	(**Socialization**) -e.g Team meetings and discussions	(**Externalization**) -e.g Dialog within them answer questions
EXPLICIT	(**Internalization**) -e.g Learn from a report	(**Combination**) -e.g Email, a report

Fig 1: SECI Model & Knowledge Conversion.

Knowledge management as the identification, capture, organize, and disseminate intellectual assets is critical to long-term performance of the organization [6]. Knowledge management can be defined as a process to identify, select, organize, and disseminate critical information and expertise that is part of the company in a structured form [10].

Knowledge Management System is a system that supports the management and organization of knowledge stored. Knowledge management system built using three components of the technology are communication, collaboration, storage & retrieval [11].

B. Technology Acceptance Model (TAM)

TAM introduced by F.D. Davis [5], is the adoption of the Theory of Reasoned Action (TRA), which is designed specifically to model user acceptance of information systems. Purpose of this method is to provide an explanation of the determinants of acceptance of the use of computers in general, able to explain the behavior of users for all ranges and populations of users of computer technology, which meets in parsimonious and theoretically.

TAM proposes two things are believed to be the facts, perceived usefulness and perceived ease of use, as the main connection to the computer acceptance behavior. The chart of TAM can be seen in Figure 2. Perceived usefulness is defined as the degree to which a person believes that using a particular system can improve its performance, and perceive ease of use is defined as the degree to which a person believes that using the system is not required any effort (free of effort). Perceive ease of use also affects the perceived usefulness which may mean that if a person feels the system is easy to use, the system is useful for them.

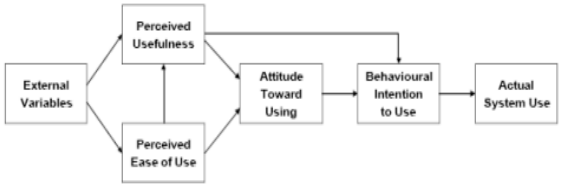

Fig 2: Technology Acceptance Model.

III. METHOD

A. Research model and hypotheses

This research model refers to previous studies conducted by M. Masrom [12]. The study took a sample of the student in the Science Department at the College of Science and Technology, University Technology of Malaysia (UTM). Differences in the current research lies in the population, time and object of the research. The object of this research is KMS on PT. XYZ, while research conducted by Masrom is an e-learning UTM. The population in this study are employees as KMS users and the population in the study conducted by Masrom is the student that use of e-learning in which are in UTM. This research was conducted in 2016, while research conducted by Masrom conducted in 2007.

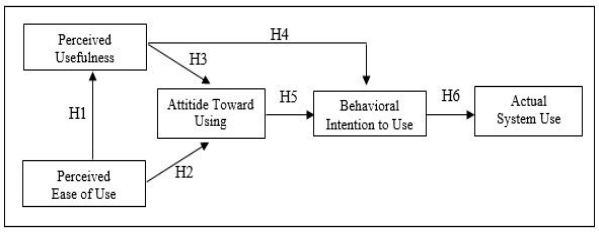

Fig 3: Research Model.

The relationships between perceived ease of use, perceived usefulness, attitude toward using, and intention to use KMS system are hypothesized as the following:

1) Perceived ease of use positively affects perceived usefulness of KMS.
2) Perceived ease of use positively affects attitudes towards using KMS.
3) Perceived usefulness positively affects attitudes towards using KMS.
4) Perceived usefulness positively affects intention to use KMS.
5) Attitude towards using positively affects intention to use KMS.
6) Intention to use positively affects Actual system usage KMS.

The relationship is shown in Figure 3.

B. Population and Sample

Population used in this study is all employees of PT. XYZ which has job-related to product development that is as much 87 person. The sampling technique that used was probability sampling with random sampling technique, is a technique sampling is done randomly, so that all members of the population have an equal opportunity to be sampled. The number or size of the sample is calculated by using the formula of Slovin. With a population of 87 person and the estimated sampling error is 5%, the minimum number of samples to be used in this study according to the Slovin formula [13] was 72 respondents.

IV. RESULTS AND DISCUSSION

This test was conducted to evaluate the implementation of KMS on PT XYZ. SmartPLS application is use in this study to analyze of partial least square-path modeling. Evaluation models in PLS-PM carried out two stages of evaluation outer model or models of measurement and evaluation of the inner models or structural model.

A. Evaluation outer model or models of measurement

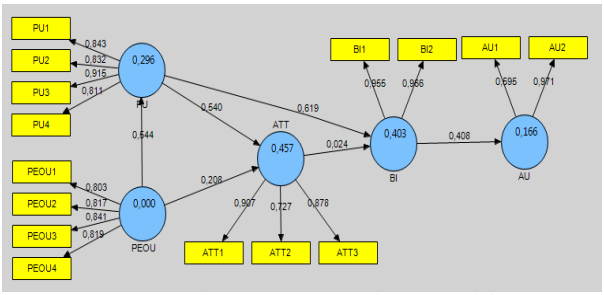

Fig 4: Loading Factor Inner and Outer Model.

Tests on reliability item (validity indicator) can be seen from the loading factor (standardized loading). This factor loading value is a correlation between the magnitude of each indicator and construct. Rated loading factor above 0.7 can be said to be ideal, it means that the indicator could be valid as an indicator to measure the construct. Nonetheless, the value of standardized loading factor above 0.5 is acceptable.

TABLE 1: Construct Reliability and Validity

Variable	*Item*	*Loadings*	*AVE*	*Composite Reability*	*Cronbach's Alpha*
Attitude Toward Using	AT1	0.907	0.708	0.878	0.787
	AT2	0.727			
	AT4	0.878			
Actual Use	AU1	0.595	0.649	0.777	0.557
	AU2	0.971			
Behavior Intention	BI1	0.955	0.922	0.960	0.916
	BI2	0.966			
Perceived ease of use	PE1	0.803	0.672	0.891	0.839
	PE2	0.817			
	PE3	0.841			
	PE4	0.819			
Perceived Usefulness	PU1	0.843	0.724	0.913	0.837
	PU2	0.832			
	PU3	0.915			
	PU4	0.811			

A construct can be said to be valid if the result of Average Variance Extracted (AVE) is greater than 0.5 and the

minimum value of the loading factor greater than 0.5 or ideally more than 0.7 [14]. AVE value for each variable in Table 1 has a value of more than 0.5 indicating that the latent constructs showed convergent validity. Each of the variables can explain more than 50% of the variance in the indicators [15]. As seen in Table 1, for each construct the loading value has a value greater than 0.7. Thus, all construct is fit the criteria of convergent validity.

Examination discriminant validity of the measurement model reflective assessed by cross loading and comparing the value of the square of the correlation between AVE construct. The size of the cross loading is to compare the correlation of the indicators with its construct and construct from another block. The good value of discriminant validity will be able to interpret higher value of variable indicator than other variance of another constructs indicator. Table 2 is present the value of discriminant validity for each indicator.

TABLE 2: Discriminant Validity

	ATT	AU	BI	PE	PU
AT1	**0,907**	0,374	0,371	0,422	0,523
AT2	**0,727**	0,383	0,335	0,504	0,512
AT4	**0,878**	0,378	0,369	0,340	0,604
AU1	0,032	**0,595**	0,128	0,097	0,167
AU2	0,508	**0,971**	0,430	0,358	0,436
BI1	0,428	0,321	**0,955**	0,270	0,592
BI2	0,396	0,454	**0,966**	0,321	0,625
PE1	0,485	0,321	0,197	**0,803**	0,439
PE2	0,405	0,358	0,322	**0,817**	0,426
PE3	0,286	0,257	0,131	**0,841**	0,345
PE4	0,425	0,174	0,329	**0,819**	0,534
PU1	0,483	0,393	0,502	0,393	**0,843**
PU2	0,445	0,089	0,433	0,455	**0,832**
PU3	0,628	0,451	0,663	0,527	**0,915**
PU4	0,632	0,456	0,527	0,464	**0,811**

Based on the above table shows that all the loading factor values for indicators in each variable has a higher correlation compared to other variables.

B. Evaluation of the inner models or structural model

Significant effect of the construct can be seen from the path coefficient. Signs in the path coefficient should be consistent with the theory that hypothesized, to assess the significance of the path coefficient can be seen from the t-test (critical ratio) obtained from the bootstrapping process (resampling method).

TABLE 3: Path Coefficient

Path	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
AT-> BI	0,019	0,127	0,127	0,187
BI-> AU	0,428	0,153	0,153	2,665
PE-> AT	0,225	0,103	0,103	2,024
PE-> PU	0,551	0,082	0,082	6,623
PU-> AT	0,528	0,089	0,089	6,086
PU -> BI	0,627	0,106	0,106	5,824

Testing criteria is reject Ho if t-test> t-table or t-test <- t-table. From table t with value $\alpha = 0.05$ and df = n-2 = 78-2 = 76 thus obtained value of t-table is 1.992. The results obtained from PLS test are presented in Table 3. It appears that the only effect of attitude toward using that no significant effect on behavioral intention, because the value t-test 0.187 less than t-table 1.992, while the coefficient of lanes on the other hypothesis significant effect. For more details on any hypothesis outlined below and with the following criteria:

t-test <- t-table (1.992) = Ho is accepted and Ha rejected

t-test ≥ t-table (1,992) = Ho is rejected and Ha accepted

Based on the results of data processing of the structural model, the result output for first hypothesis in the form of t-value is 6.623 greater than 1.992, it can be concluded that the variable Perceived ease of use positively affects the perception of the benefit in using the system significantly. The benefit in using the system will be the better, with the magnitude of the effect of 0.544. Second hypothesis in the form of t-value is 2.024 greater than 1.992, it can be concluded that the variable Perceived ease of use positively affects the attitude of use in using the system significantly, with the magnitude of the effect of 0.208. Third hypothesis in the form of t-value of 6.086 greater than 1.992, it can be concluded that the perception variable benefit in using the system positively affects the attitude of use in using the system significantly. The benefit in using the system will be the better, with the magnitude of the effect of 0.540. Fourth hypothesis in the form of t-value is 5.824 greater than 1.992, it can be concluded that the behavior of the variables Perception interest in using the system positively affects the attitude of use in using the system significantly, hence the interest in using the system's behavior will be the better, with the magnitude of the effect of 0.619. Fifth hypothesis in the form of t-value is 0.187 is smaller than 1.992, it can be concluded that the perception Attitude variable usage does not affect the perception of the behavior of intention. Sixth hypothesis in the form of t-value is 6.623 greater than 1.992, it can be concluded that the behavior of intention positively effects on the perception of the real conditions of use of the system significantly, with the magnitude of the effect of 0,544.

Based on the value of R2 is known that variable ATT has R square of 0.456 which means PU and PEOU able to explain the variable ATT of 0.456 or 45.6%. Furthermore, variable AU has R square of 0.166 which means BI is able to explain the variable of 0.166 AU, or 16.6%.

Then the variable BI has R square of 0.403 which means PU and ATT is able to explain the variable BI amounted to 0.403 or 40.3%. And variable PU has R square of 0.296 which means PEOU able to explain the variable PU amounted to 0,296, or 29.6%. Contributions to the value of R2 is from construct / variables can be seen from the following table.

TABLE 4: R^2 Result

	R Square
AT	0,456596
AU	0,166249
BI	0,402811
PE	-
PU	0,296412

To validate the model as a whole, then used the goodness of fit (GoF). GoF index is a single measure that is used to validate the performance of combined measurement model and structural models. GoF value is derived from the average communalities index multiplied by the value of R2 models. Here are the results of the calculation of goodness of fit models:

TABLE 5: Average Communalities Index

	AVE	R Square
AT	0,708	0,457
AU	0,649	0,166
BI	0,922	0,403
PE	0,672	-
PU	0,724	0,296
Average	0,735	0,331
Goodness of Fit (GoF)	0,493	

Based on Table 5, the average yield was 0.541 communalities. This value is further multiplied by R2 and rooted. Calculation shows that the value of 0,493 GoF more than 0.36 so that the GoF categorized as large, suggesting that the model is very good (has a high ability) in explaining the empirical data.

V. CONCLUSIONS

This study aimed to analyze the implementation of knowledge management system at PT. XYZ. The model used in this study is the Technology Acceptance Model. The research variables include the perceived usefulness, perceived ease of use, attitude, behavioral intention to use and actual use. Based on the analysis and the research, the study concluded that: Perceived ease of use significantly influence Perceived usefulness of the use KMS, which means that the perception of the ease of system use the high and low impact on the benefits of KMS. Perceived ease of use significantly influence the attitude in the use chart that shows that perceptions of the ease of system use an impact on the attitude of the likes and dislikes of the KMS. Perceived usefulness significantly influence the attitude in the use of KMS showing that the perception of the benefits of a positive impact on employee attitudes toward KMS. Perceived usefulness significant effect on Behavioral Intention to use KMS. This indicates that there is the perception of the benefits KMS impact on the desire to use (or not use) KMS. Attitude has no significant effect on behavioral intention to use KMS indicating that attitude is not associated with the desire to want to use the system. Behavioral Intention to use a significant effect on Actual use KMS. This indicates that the interest in the behavior of an impact on the real conditions of employees to use KMS.

Thereby it can be concluded that by using a model of the Technology Acceptance Model (TAM) is an information technology acceptance model consists of variable usefulness and ease of use proven to explain the employees' acceptance of Knowledge Management System at PT. XYZ.

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