

Analysis Of Acceptance and Use of E-Procurement Applications Using Unified Theory of Acceptance and Use of Technology (UTAUT) In the Procurement of Goods and Services at PT. JMS

Zulkifli Jufri ¹, Budiman ²

¹ Gunadarma University Postgraduate Masters Program in Management, Jakarta, Indonesia

² Lecturer in the Postgraduate Masters Program in Management in Gunadarma University, Jakarta, Indonesia

ABSTRACT

This study analyzes the acceptance and use of e-Procurement applications using the UTAUT Model developed by Vankatesh (2003). Respondents in this study were 182 people from the entire population at PT. JMS has the duty to carry out procurement or parties who have an interest in e-procurement applications. There are six hypotheses in this study that have been processed using partial least squares (PLS). Research shows that performance expectations, business expectations and social factors significantly influence the interest in using e-Procurement applications, as well as the conditions that facilitate and interest in the use of technology significantly influence the behavior of using e-Procurement applications. This research model results in an R² value in the endogenous construct of technology utilization interest of 0.64 and an R² value in the endogenous construct of application usage behavior of 0.73 which means that the model is substantial enough to predict the acceptance and use of e-Procurement applications in the procurement process goods and services at PT. JMS.

Keywords: UTAUT, e-Procurement, Partial Least Square

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I. INTRODUCTION

An effective and efficient in procurement of goods and/or services of PT. JMS is one of the important part in improving the financial management of PT. JMS. Geographical location of PT. JMS which spread throughout Indonesia does not allow the procurement process to be carried out in a centralized manner so that it is carried out by each unit of work.

One of the control of the procurement process carried out by each unit of work, PT. JMS utilizes information technology in the process of procuring goods and/or services. The process of procuring goods and/or services of PT. JMS by electronic system will further improve and ensure efficiency, effectiveness, transparency and accountability in the spending of PT. JMS. In addition, the process of procuring goods / or services of PT. JMS by electronic system can also ensure the availability of information, and encourage fair competition and the realization of justice (non-

discriminative) for all business actors who participate in the process of procuring goods and/or services at PT. JMS.

In the context of implementing the procurement of goods and/or services of PT. JMS with the electronic system, the Deputy Director of Procurement developed an electronic application for the procurement of goods and/or services called e-Procurement to be applied in the process of procuring goods and/or services at the Head Office, Regional Offices and Branch Offices throughout Indonesia.

Nowadays, the utilization of the e-Procurement application is not maximized, in fact there are still many procurement processes that are carried out without using the e-Procurement application, employees who carry out the procurement process know the benefits of using the e-Procurement application but for reasons of sudden procurement or it is easier without using the application makes the procurement implementers do not use the e-Procurement application.

The level of user acceptance regarding the implementation of the e-Procurement application at PT. JMS can be measured by one of the theoretical approaches that can describe the level of acceptance and use of a technology, namely the Unified Theory of Acceptance and Use of Technology (UTAUT). Through UTAUT, it can be understood that the reactions and perceptions of users towards technology can influence their attitude in accepting the use of technology.

II. BASIC THEORY

A. E-Procurement

Electronic procurement or e-Procurement is the procurement of goods and/or services carried out using information systems and electronic transactions in accordance with statutory provisions. According to Hardjowijono (Nightisabha et al, 2009) that the

benefits of implementing e-Procurement are as a tool in creating governance that is free from corruption and nepotism as a macro benefit from e-Procurement, and as for the direct benefits expected from the implementation of e-Procurement which is a shorter process, especially in terms of time and bureaucracy as well as cost savings in the procurement process. E-Procurement according to Muhtar (2011) is an electronic procurement of goods and services that regulates business transactions through computers and the process of procuring goods and services is carried out online. The benefits of e-Procurement according to Palmer (Nightisabha et al, 2009) are achieving good collaboration between buyers and suppliers, reducing the use of field workers, improving coordination, reducing transaction and procurement costs, low inventory levels and good transparency. Then Oliviera also explained (Purwanto et al, 2008) that e-Procurement is the process of purchasing goods and services needed for operational needs electronically. Neef (Purwanto et al, 2008) states that e-Procurement is the adoption of an internet-based system in the purchasing process. Meanwhile, according to Croom and Jones (Purwanto et al, 2008) the notion of e-Procurement is an integrated and wide area database system based on the internet with a network of communication systems in part or all of the purchasing process.

B. UTAUT

Unified theory of Acceptance and Use of Technology (UTAUT) is a theory of acceptance and use of technology developed by Vankatesh, Thong and Xu (2003), UTAUT was developed through studies conducted on eight models / theories of acceptance / technology adoption that are widely used in previous Information System research. UTAUT has four main constructs that directly affect user acceptance and user behavior. These four constructs are 1) performance expectancy, 2) effort expectancy, 3) social influence, and 4) facilitating conditions.

In detail, each construct can be described as follows:

1. Performance expectancy is defined as the degree to which an individual believes that using the system will help in improving his performance. This concept describes the benefits of the system for users related to perceived usefulness, extrinsic motivation, job fit, relative advantage (Venkatesh et al., 2003).
2. Effort expectancy is the level of ease of use of the system that will be able to reduce the effort (energy and time) of individuals in doing their work. The three constructs that make up this concept are perceived ease of use, ease of use, and complexity (Venkatesh et al., 2003).
3. Social factors are defined as the degree to which an individual perceives that others convince him that he should use the new system. Social factors as direct determinants of interest in using IS are represented by related constructs, namely subjective norms, social factors and image (Venkatesh et al., 2003).
4. The conditions that facilitate the use of information technology are the degree level to which a person believes that the organizational and technical infrastructure exists to support the use of the system. Triandis (1980) defines supporting conditions as “objective factors that can facilitate carrying out an action. The theory of attitude and behavior proposed by Triandis (1980) in Tjhai (2003) states that the use of information technology by workers is influenced by individual feelings towards the use of personal computers, social norms in the workplace that pay attention to the use of personal computers, habits related to computer use, consequences expected from the use of personal computers, and the conditions that facilitate the use of information technology. Research Thompson, et, al. (1991) found that there was no relationship between conditions that facilitate users and the use of information technology.
5. Interest in the use of information technology (behavioral intention) is defined as the level of desire or intention of users to use the system continuously with the assumption that they have access to information. Thompson et. al., (1991) stated that a person's belief in the usefulness of IS will increase their interest and in the end the individual will use IS in his work. Venkatesh et. al., (2003) stated that there is a direct and significant relationship between interest in the utilization use of SI and the use of SI.
6. The behavior of using information technology (use behavior) is defined as the intensity and/or frequency of users in using information technology. The behavior of using information technology is very dependent on the user's evaluation of the system. An information technology will be used if the information technology user is interested in using the information technology because of the belief that using the information technology can improve their performance, using information technology can be done easily, and the influence of the surrounding environment in using the information technology. In addition, the behavior of using information technology is also influenced by conditions that facilitate users in using information technology because if the information technology is not supported by the necessary equipment and facilities, the use of information technology cannot be implemented.

Related to this research, it can be defined that:

1. Performance Expectancy (PE) is defined as an action where someone believes that using e-Procurement will help improve their performance.
2. Effort Expectancy (EE) is defined as the level of ease associated with using the system.
3. Social Influences (SI) is defined as the extent to which an individual perceives the importance of

his work environment (in this case the social sphere) in the use of the new system.

4. Facilitating Condition (FC) is defined as the level to which a person believes that an organization and technical infrastructure exist to support the use of the system.
5. Behavior Intention (BI) is the main behavior of organizations in technology acceptance. Consistent with the theory that underlies all the effects on Behavioral Intention above, it is expected that Behavioral Intention will have a significant influence on the use of technology.
6. Use Behavioral (UB) is the behavior to be achieved in the use of technology.

C. Partial Least Square (PLS)

PLS is a component or variant-based Structural Equation Modeling (SEM) equation model. According to Ghozali (2006), PLS is an alternative approach that shifts from a covariance-based SEM approach to a variance-based approach.

The PLS specification model is divided into 2, namely:

1. Structural Model (inner model)

The structural model or inner model describes the relationship between latent constructs based on the theory. The design of the structural model of the relationship between latent constructs is based on the formulation of the problem or hypothesis (Ghozali, 2006).

2. Measurement Model (outer model)

The measurement model or outer model defines how the attitude of the indicator block relates to its latent construct. The design of the measurement model determines the nature of the indicators of each latent construct, whether reflexive or formative, based on the operational definition of the variable (Ghozali, 2006).

III. METHODOLOGY

The object of the research used is the employees in the branch office, regional office and PT.JMS head office .

According to Morissan (2012), the population is a collection of subjects, variables, concepts, or phenomena. Examining each member of the population can be done to determine the nature of the population in question. The population in this study are users of e-Procurement applications either in the General Sector or in other working unit who have an interest in the use of e-Procurement applications.

The sample according to Morissan (2012) is part of the population that represents the entire population that is representative, a sample that is not representative of every member of the population, regardless of the sample size, cannot be generalized to explain the nature of the population in which the sample is taken. The population in this study is not large, so the entire population is designated as a research sample whose function is to test and measure every element in the population

According to Sugiyono (2013) Research variables are everything in any form determined by the researcher to study so that information is obtained about it, then conclusions are drawn.

This study used the UTAUT approach which was adapted according to the research objectives. The UTAUT constructs used include:

1. Exogenous constructs, then known as sources variables or independent variables that are not predicted by other variables in the model. The exogenous constructs in this study are the constructs of performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC).
2. Endogenous constructs, are the factors that are predicted by one or more constructs. Endogenous constructs can predict one or several other

constructs, but endogenous constructs can only be causally related to endogenous constructs. The endogenous constructs of this study are the constructs of behavior intention (BI) and use behavior (UB).

The data used is primary data derived from the results of a questionnaire survey using an online survey format (google docs) involving about 182 respondents using the e-Procurement application, which consists of 2 parts;

1. The first part consists of questions related to the respondent's personal data
2. The second part is used to obtain data regarding the dimensions of the question using a Likert scale ranging from 1 to 5 with responses Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4 and Strongly Agree = 5.

The conceptual description of the research model with the UTAUT model can be seen in Figure 1.

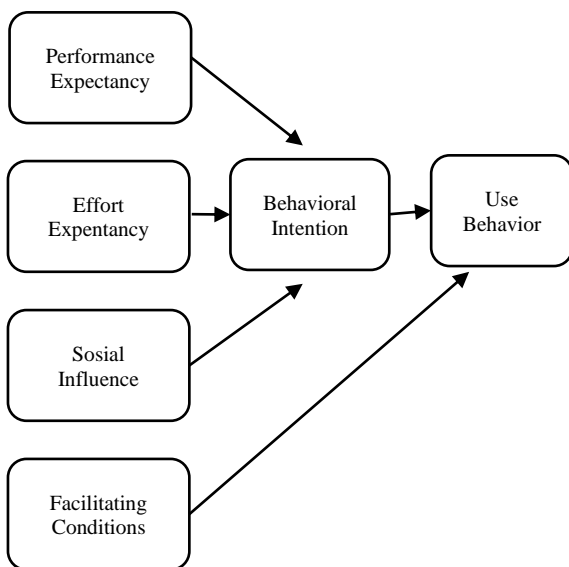


Figure 1. Conceptual Model Research Model of Acceptance and Use of e-Procurement Applications (refer to Venkatesh et al, 2003)

Referring to the research conceptual model in Figure 1, the hypotheses used are as follows:

1. There is an effect of performance expectancy on behavioral intention to use e-Procurement applications.
2. There is an effect of effort expectancy on behavioral intention to use e-Procurement applications.
3. There is an influence of social factors (social influence) on the interest in the use (behavioral intention) of e-Procurement applications.
4. There is an influence of facilitating conditions on the use behavior of e-Procurement applications
5. There is an influence of interest in utilization (behavioral intention) affecting the behavior of the use (use behavior) of e-Procurement applications

IV. RESULTS AND DISCUSSION

Model testing is carried out to determine the contractual relationship with the indicators. In data analysis using PLS, there are 3 stages, namely convergent validity, discriminant validity and composite reliability.

A. Indicator Reliability

Testing of validity indicators is carried out to ensure that each indicator is able to explain the latent variables. Before testing, the model must be defined first, then tested using the PLS Algorithm and bootstrapping. This step is done to see the reliability of the indicator by calculating the loading factor of each indicator. The validity indicator can be seen from the factor loading value. If the loading factor value of an indicator is more than 0.5 (> 0.5) and the t statistic is more than 2.0 (> 2.0), then it is said to be valid. On the other hand, if the loading factor value of an indicator is less than 0.5 (< 0.5) and has a t statistic value of less than 2.0 (< 2.0), it is said to be invalid. This study used a loading factor > 0.5 . Indicators that have a loading factor value of < 0.5 will be removed. (Sofyan Yamin, Heri Kuniawan, 2011).

Table 1
Output Outer Loading

| | BI | EE | FC | PE | SI | UB |
|-----|------|------|------|------|------|------|
| BI1 | 0.97 | | | | | |
| BI2 | 0.97 | | | | | |
| EE1 | | 0.91 | | | | |
| EE2 | | 0.92 | | | | |
| EE3 | | 0.83 | | | | |
| FC1 | | | 0.80 | | | |
| FC2 | | | 0.88 | | | |
| FC3 | | | 0.78 | | | |
| FC4 | | | 0.83 | | | |
| FC5 | | | 0.79 | | | |
| PE1 | | | | 0.89 | | |
| PE2 | | | | 0.88 | | |
| PE3 | | | | 0.89 | | |
| PE4 | | | | 0.84 | | |
| SI1 | | | | | 0.90 | |
| SI2 | | | | | 0.90 | |
| SI3 | | | | | 0.91 | |
| UB1 | | | | | | 0.92 |
| UB2 | | | | | | 0.93 |

B. Convergent Validity

Convergent Validity is used to measure the extent to which each variable that reflects the convergent construct is compared with the variables to measure the different constructs. Fornell and Larcker proposed a value of Average Variance Extracted (AVE) > 0.500 (Urbach and Ahlemann, 2010). Based on the measurement results in Figure 2, the AVE value describes adequate convergent validity (AVE > 0.500) which means that the construct has good convergent validity. (Sofyan Yamin and Heri Kuniawan, 2011).

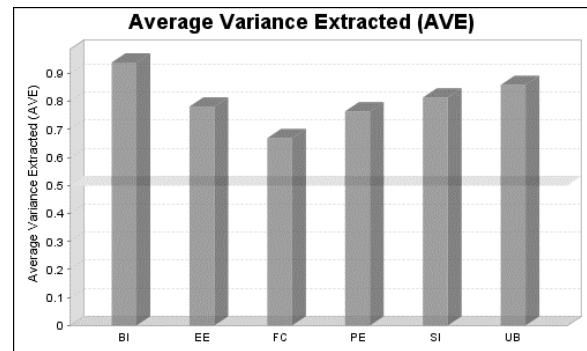


Figure 2. AVE Output

C. Discriminant Validity

Discriminant Validity evaluation is carried out in two stages, namely looking at the cross loading value to see how far the measurement of the constructs is different from the others. Discriminant validity is seen from the cross loading value. Cross loading is determined by looking at the relationship between the component scores of each latent variable with all other items. If the loading of each indicator is higher than the designated construct than the other constructs, and each construct is the highest load of its own item, it can be said that the model construct is different from the others. In this study, the cross loading value > 0.700, as shown in table 2 can be said to have good discriminant validity.

Table 2
Output Cross Loading

| | BI | EE | FC | PE | SI | UB |
|----|------|------|------|------|------|------|
| BI | 0.97 | | | | | |
| EE | 0.64 | 0.88 | | | | |
| FC | 0.78 | 0.66 | 0.82 | | | |
| PE | 0.74 | 0.69 | 0.82 | 0.87 | | |
| SI | 0.75 | 0.65 | 0.89 | 0.78 | 0.9 | |
| UB | 0.82 | 0.64 | 0.79 | 0.67 | 0.78 | 0.93 |

D. Internal Consistency Reliability

Internal Consistency Reliability can be measured in two ways, namely by Cronbach's Alpha and composite reliability. Alpha Cronbach assumes that all indicators are equally reliable. Therefore, it often

overrides the reliability of the internal consistency of latent variables in PLS. According to (Cronbach, 1951) the Cronbach Alpha value should not be less than 0.600. Figure 3 shows the results of Cronbach's Alpha test, the results show that all constructs have a value > 0.600. It can be concluded that the reliability of internal consistency is met.

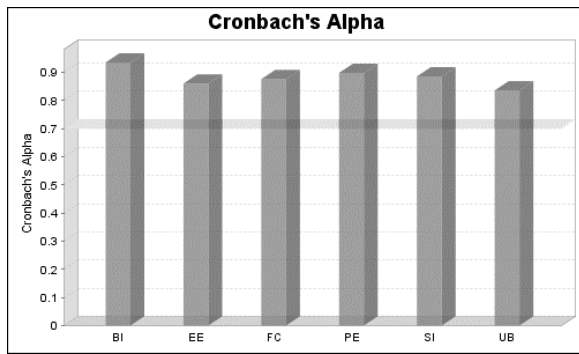


Figure 3. Output of Cronbach's Alpha

V. RESULTS HYPOTHESIS TEST

At this testing stage, an examination of the structural model is carried out, where this examination includes the significance (hypothesis above) and the value of R Square. Based on the path coefficients table below, Performance expectancy, Effort Expectancy, and Social Influence are significant on Behavioral Intention, because they have a t statistic value greater than 2.0. Path coefficients also show significant Behavioral Intention and Facilitating Conditions on use behavior. (Sofyan Yamin and Heri Kuniawan, 2011).

Table 3
Output Path Coefficients

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (O/STDEV) |
|----------|---------------------|-----------------|----------------------------|--------------------------|
| PE -> BI | 0.308 | 0.305 | 0.080 | 3.853 |
| SI -> BI | 0.400 | 0.400 | 0.078 | 5.142 |
| FC -> BI | 0.400 | 0.397 | 0.089 | 4.498 |

| | | | | |
|----------|-------|-------|-------|-------|
| UB | | | | |
| EE -> BI | 0.171 | 0.174 | 0.074 | 2.330 |
| BI -> UB | 0.505 | 0.510 | 0.106 | 4.789 |

The final value of R Square is as follows;

Table 4
Output R Square

| | R Square | R Square Adjusted |
|----|----------|-------------------|
| BI | 0.64 | 0.63 |
| UB | 0.73 | 0.73 |

Judging from the results of the R-square output in table 4 above, it indicates that the structural model in this study belongs to the "good" category (Ghozali, 2006).

The R Square value of the Behavioral Intention construct is 0.64%. This means that the construct of effort expectancy, performance expectancy, social influence, can only explain 64% and the rest is explained by other variables outside the model.

The value of R Square for construct use behavior is 0.73%. This means that the behavioral intention construct and the facilitating conditions h can only explain 73% and the rest is explained by other variables outside the model.

VI. CONCLUSION

e-Procurement applications by employees of PT. JMS which has users in the e-Procurement application using The Unified Theory Of Acceptance and Use Of Technology (UTAUT) model can be concluded that the Performance Expectancy (PE) construct has a positive effect on the Behavior Intention (BI) construct by 31%, the Effort Expectancy construct (EE) has a positive effect on the Behavior Intention (BI) construct of 17%, the Social Influence (SI)

construct has a positive effect on the Behavior Intention (BI) construct of 40%, the Behavior Intention (BI) construct has a positive effect on the Use Behavior (UB) construct of 50%, the Facilitating Condition (FC) construct has a positive effect on the Use Behavior (UB) construct by 40%.

In this regard, it is hoped that the management of PT. JMS can increase the benefits and usability of using e-Procurement applications in the process of procuring goods and/or services and increase the ease of use of e-Procurement applications.

e-Procurement application will be more useful by receiving input for improvement from procurement implementers at the Head Office, Regional Offices and Branch Offices so that the application is used to meet the needs of its users.

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