The Effect Of Risk And Trust On The Behavioral Intention Of Using E-Procurement

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Abstract

Purpose – The occurrence of risk and lack of trust on technology information system has been suspected as the main causes of unwillingness of users to adopt the system. This study seeks to investigate the effect of risk and trust on the behavioral intention of using a new method of governmental auctions, e- procurement system.

Design/approach – A theoretical model was tested through a survey of 83 supply chain members using email and distributed questionnaires to the entire governmental supply chain in Yogyakarta.

Findings – Empirical results confirm the basic structure of the model. Risk and trust correlate to the behavioral intention of using e-procurement system.

Research limitations/implications – The study indicates that risk and trust were factors that are related to the behavioral intention of using e-procurement system. In addition to improving the system benefits and ease of use, the local government may focus on minimizing risk and improving trust: the system should have good security and trustworthy. This may lead to improve customer loyalty toward the system.

Originality/value – This study represents an important first step in examining and integrating risk and trust on the technology acceptance model in the supply chain context.

Keywords - *e-procurement, risk, trust, behavioral intention and government*

Introduction

The advancement of information technology has introduced major changes in the worldwide economic and business enterprises because of its benefits. The government of Indonesia has also used the system of information technology to help daily activities. Under the central government regulation of Indonesia, For example, each local government has been recommended to implement e-procurement system, a platform in which consumers place requests for proposals online and invite suppliers to bid for contracts (Klafft, 2009). According to Albano et al. (2008) and Hsu (2006), the governmental e-procurement generally could give preferences for local suppliers to compete in making a bid and remove centralization. The local government can also use the system to reduce purchasing and transaction costs, compare among different goods and services and save buyers' time. The system will make it easy to get new customers, and give suppliers' an opportunity to compete fairly.

Users of the e-procurement system, however, tend to reject the system due to its risk and untrustworthy. Risk occurs because buyers and suppliers do not meet face-to-face. Belkhamza (2009) stated that a lack of information creates risk in doing business. Uncertainty about product quality is a problem for buyers in the online environment. For example, buyers do not have easy access to get information about product quality, and therefore they are unable to judge the quality of product prior to the purchase. Buyers' personal identification also creates a problem for suppliers because buyers can change their identities or give incorrect identities when they should pay for the products

Trust is a requirement of many business interactions and is important in an online environment when all customers have to enter in web pages (Frederick, 2000; Gefen, 2000; see Gefen and Straub, 2003) because of the inherent uncertainty of information (Fukuyama, 1995; see Gefen and Straub, 2003). Data released by the Internet Crime Complaint Center (Klafft, 2009) showed that trust is a major issue in e-procurement. For example, in 2005, the vast majority of all internet-related fraud complaints concerned e-commerce and particularly e-auction activities, thus

distrust will occur immediately. Consequently, a lack of trust is one of reasons for buyers and sellers to avoid trading through online (Gefen et al., 2003).

This study seeks to investigate the effect of risk and trust on the behavioral intention of using a new method of governmental auctions, e- procurement system. To test the impact of the two factors, we integrate the variables with the existing information system acceptance model introduced by Davis (1986 and 1989), Technology Acceptance Model (TAM). The model assumes two factors influencing users adopt the system: perceived ease of use and perceived usefulness. The model, however, implies that it opens for new variables. The parsimony of the model is another reason to adopt Davis's work as a basic model.

Theoretical Background Hypothesis Formulation

There are two reasons for people to accept or reject information technology. First, people tend to use or not use an application whether the technology will help the users performing their job better. Second, the people believe that the system is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application (Davis, 1989). However, Technology Acceptance Model becomes popular because Technology Acceptance Model has been used by many information system researchers (Agarwal and Prasad, 1999; Adams et al., 1992; and Guriting and Ndubisi, 2006).

Perceived ease of use and perceived usefulness are important because they are the reasons of using Information Technology. In perceived ease of use, the user will feel clear and understandable in using information technology. Definition of perceived ease of use gives indication that a system will make users easy to operate and finish their job and the system is not designed to make the users difficult (Ndubisi et al., 20003; Davis et al., 1989; and Guriting and Ndubisi, 2006). Perceived ease of use in using e-procurement indicates that the system is easy to be understood and operated. Consequently, the users will have intention to use the system regularly.

Perceived usefulness is a belief that using information technology will enhance the job performance of users or will help the users in doing their job. Perceived usefulness to the technology usefulness can be measured by several factors, there are: (1) adopting technology can increase users' productivity, (2) increasing job performance, (3) increasing efficiency process of users (Ndubisi et al., 20003; Davis et al., 1989; and Guriting and Ndubisi, 2006). Someone will adopt new information technology system, especially e-procurement in this research if that system can give usefulness for their job and ahievement. In the other words, the level of usefulness affects the behavioral intention of user.

Risk

Cunningham (1967) stated that risk is the magnitude that would be lost if the consequences of an act were not favorable, and the individual's subjective feeling of certainty that the consequences will be unfavorable. Risk in online transaction will happen because the buyers and suppliers do not meet face-to-face. It will be riskier if the users of information technology are not honest when doing transaction through online, and the examples of risk in online transaction are financial risk, performance risk, time-loss risk, social risk, physical risk, psychological risk, source risk, and privacy risk (Hassan et al., 2006). Bakos and Wrynjolfsson (1993) and Nicolaou and McKnight, (2006) suggested that closer relationships with suppliers can reduce risk, especially in using information technology.

Nicolaou and McKnight (2006) stated that risk will affect negatively on the behavioral intention of information technology users. One has to accept some risk to adopt an exchange system, because transactions may or may not go as expected. Unfortunately, if the use of an electronic exchange is risky, risk perception affects a user's intention to stop using the exchange. It means that if there is risk in the information technology, the intention of using information technology will decrease. Therefore, the first hypothesis is:

H1: There is a negative relationship between risk and behavioral intention of using

Trust

Trust is needed by the users of information technology in order to increase individual performance in doing the activities of their organization or company. Trust also helps to reduce the social complexity a consumer faces in e-commerce by allowing the consumer to point out undesirable of the e-vendor, including inappropriate use of

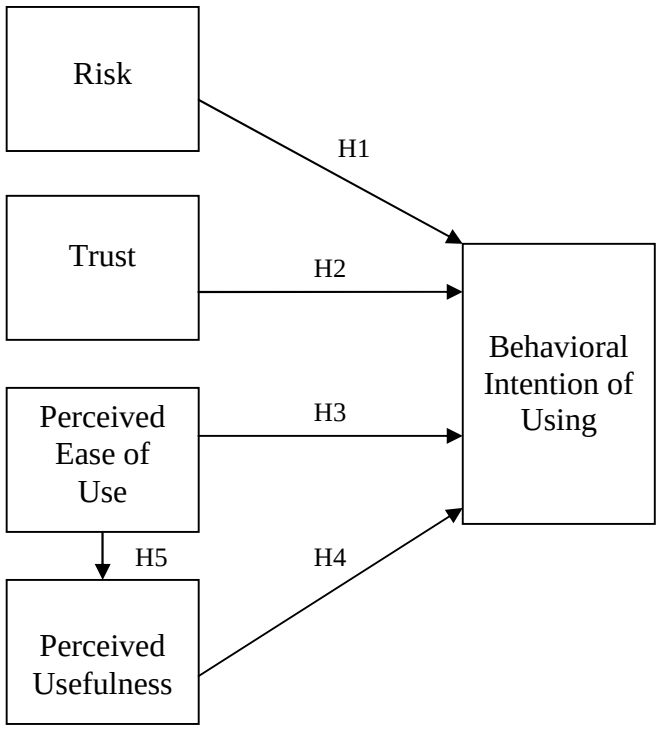
purchase information. Faced with a legal framework that eliminates illegal behaviors, the consumer must trust the e-vendor and reversely the e-vendor must trust the consumer, as in physical commercial activities and in other e-commerce settings (Williamson, 1985; Gefen, 2000; see Gefen and Straub, 2003).

A general belief in an e-vendor that results in behavioral intention is conceptualized as trust. A combination of trustworthiness, integrity and benevolence of e-vendors can increase behavioral intention if there are communication and honesty. Trust that is considered as an important part can be delivered with specific rules for communicating. By providing same perception of trust between the government and the users in a case of e-procurement, it will create a relationship to support trust and intention to use e-procurement (Gefen, 2000; Jarvenpaa and Tractinsky, 1999; see Gefen et al., 2003).

Previous research has showed that trust increases purchase intentions both directly, there are buyer-seller relationship and reducing perceived risk (Gefen, 2000; Ganesan, 1994; see Gefen et al., 2003). Consequently, Gefen et al. (2003) convinced that heightened levels of trust are also associated with heightened levels of intended use. Accordingly, the second hypothesis is:

H2: There is a positive relationship between trust and behavioral intention of using

Figure 1: Research Model



Research Method

Population and Sample

The target population on this research was the users of e-procurement system in Yogyakarta. We distributed questionnaires to all current users from several companies that just attended the training of the e-procurement system conducted by LPSE (Layanan Pengadaan Secara Elektronik). The questionnaire consisted a set of statements and respondents were required to rate a Likert type of 1-6 point scale, ranging from strongly disagree to strongly agree. The study obtained 83 complete responses without considering any characteristics of users (type or size of company, income, profit, etc).

Variables

The focus of this study is on the variables of risk and trust. We integrate the 2 variables in to TAM. Therefore, we control the main variables of the TAM (perceived usefulness and ease of use) in our model. The following table shows number and source of questions and definitions of the research variables.

Table 1: Research Variables

Variables	Number of statement	References
Main variables:		
Risk	3 items	Belkhamza (2009)
Trust	7 items	Gefen et al., 2003)
Intention of Using	5 items	Gefen et al. (2003)
Control variables:		
Perceived Usefulness	5 items	Davis (1989)
Perceived ease of use	4 items	Davis (1989)

Mathematical Model

This research employed two multiple regressions to test the hypotheses. It was expected that coefficient of $ß_2$ has negative sign while $ß_3$ is positive. Similar to test validity and reliability, we estimated all coefficients of the two equations using Partial Least Square method), with the help of SmartPLS.

$$PU = ßo_1 + ß_1 \, PEOU + \varepsilon_1 \quad (1)$$

$$BIOU = ßo_2 + ß_2 \, RISK + ß_3 \, TRUS + ß_4 \, PEOU + ß_5 \, PU + \varepsilon_2 \quad (2)$$

Where:

RISK : Risk
TRUS : Trust
PEOU : Perceived Ease of Use
PU : Perceived Usefulness
BIOU : Behavioral Intention of Using

Data Analysis

Descriptive Data

The data of the samples were from the e-procurement users by after distributing questionnaires directly to the respondents and through email. Of the 100 questionnaires distributed, 83 (83%) can be processed further. A short description of respondents is as follows.

Table 2: Respondent's Classification Based on Company's Type

Type of Company	Number of Respondents	Percentage
Service	46	55.42%
Merchandising	28	33.74%
Manufacturing	3	3.61%
Service and Merchandising	6	7.23%
Total	83	100%

Source: Primary Data

From the table 2, it can be shown that the most of respondents filling the questionnaires came from service company (46 respondents or 55.42%). The second rank was from merchandising company (28 respondents or 33.74%). It was followed from service and merchandising company (6 respondents or 7.23%). The rest came from manufacturing company (3 respondents or 3.61%)

Table 3 shows that the most of respondents were relatively new users of the e-procurement system. They used the system not more than two years (71 respondents or 85.54%). Only 14.46% of the respondents already used the system more than two years.

Table 3: Respondent's Classification Based on Period Time

Period Time	Number of Respondents	Percentage
≤ 2 years	71	85.54%
> 2 years	12	14.46%
Total	83	100%

Source: Primary Data

Validity and Reliability Test

Table 4: Result for Outer Loadings

	Original Sample Estimate	**Mean of Subsamples**	**Standard Deviation**	**T-Statistic**
PU1	**0.929**	**0.937**	**0.009**	**102.424**
PU2	**0.824**	**0.854**	**0.047**	**17.458**
PU3	**0.706**	**0.749**	**0.061**	**11.599**
PU4	**0.832**	**0.848**	**0.031**	**26.695**
PU5	**0.930**	**0.933**	**0.013**	**69.543**
PEOU1	**0.948**	**0.951**	**0.013**	**71.110**
PEOU2	**0.952**	**0.956**	**0.010**	**99.476**
PEOU3	**0.941**	**0.944**	**0.013**	**74.574**
PEOU4	**0.850**	**0.859**	**0.029**	**28.976**
TRUS1	**0.867**	**0.858**	**0.061**	**14.241**
TRUS2	**0.891**	**0.898**	**0.015**	**58.228**
TRUS3	**0.938**	**0.943**	**0.015**	**64.423**
TRUS4	**0.890**	**0.894**	**0.024**	**37.723**
TRUS5	**0.810**	**0.824**	**0.027**	**29.481**
TRUS6	**0.749**	**0.784**	**0.059**	**12.629**
TRUS7	**0.824**	**0.821**	**0.030**	**27.538**
RISK1	**0.948**	**0.954**	**0.015**	**62.149**
RISK2	**0.858**	**0.861**	**0.033**	**25.683**
RISK3	**0.956**	**0.966**	**0.013**	**75.623**
BIOU1	**0.911**	**0.916**	**0.021**	**42.624**
BIOU2	**0.931**	**0.931**	**0.020**	**47.493**
BIOU3	**0.882**	**0.893**	**0.033**	**26.927**
BIOU4	**0.715**	**0.717**	**0.091**	**7.883**
BIOU5	**0.826**	**0.828**	**0.032**	**25.772**

Table 4 shows outer loadings of the indicators in the model to indicate whether each item of the questionnaire is valid. All values of factor loadings are more than 0.50 and significant (t-statistic is greater than 1.64). Therefore they meet the requirement of convergent validity.

To test the construct validity we compared the square root of Average Variance Extracted (AVE) of each construct and the correlation between one construct and the others in model. Table 5 and 6 show the result of the test and indicates that the variables in the model meet discriminant validity since the square root of AVE is greater than the correlation between one construct.

Table 5: AVE and √AVE

	AVE	√AVE
PU	0.720	0.849
PEOU	0.853	0.924
TRUS	0.731	0.855
RISK	0.849	0.921
BIOU	0.733	0.856

Table 6: Correlations of the Latent Variables

	PU	**PEOU**	**TRUS**	**RISK**	**BIOU**
PU	**1.000**				
PEOU	**0.844**	**1.000**			
TRUS	**0.788**	**0.781**	**1.000**		
RISK	**-0.404**	**-0.407**	**-0.599**	**1.000**	
BIOU	**0.819**	**0.813**	**0.840**	**-0.545**	**1.000**

Reliability Test

To test the reliability of the variables, it was indicated by the value of the composite reliability. As it is shown in the table 7, all variables were reliable. The value of the composite reliability for each construct is more than 0.70.

Table 7: Composite Reliability

	Composite Reliability
PU	0.927
PEOU	0.959
TRUS	0.950
RISK	0.944
BIOU	0.932

Research Result

The variables in this research are risk, trust, perceived ease of use, perceived usefulness, and behavioral intention of use. Testing the inner model is intended to evaluate the relationship between one latent construct or variable and intention to use. The result provided from PLS sofware is as follows:

Table 8: Result of Hypothesis Tests

	Original Estimate	**Standard Deviation**	**P-value**
PEOU -> PU ($ß_4$)	0.844	0.032	0.0000
PU -> BIOU ($ß_5$)	0.281	0.110	0.0061
PEOU -> BIOU ($ß_1$)	0.258	0.120	0.0171
TRUS -> BIOU ($ß_3$)	0.345	0.134	0.0057
RISK -> BIOU ($ß_2$)	-0.120	0.080	0.0696

As expected, table 8 shows that the coefficient of risk variable had a negative value (-0.120) and was significant at 10% level. Thus, it can be concluded that the first hypothesis is supported by the data, implying a high risk of an e-

procurement system will be followed by a tendency to less uses of the system. The result of this hypothesis test is consistent with the research of Nicolaou and McKnight (2006) which stated that there is a significant negative relationship between risk and behavioral intention of using information system.

The result in the table 8 also indicates that the data supported the second hypothesis. The value of the trust coefficient is as much as 0.345 and significant at 1% level. Therefore it was interpreted that if the users of e-procurement can get transparency, integrity, and trustworthiness in doing bid or auction transactions, their intention of using e-procurement system will be high as well. This is consistent with the finding by Gefen et al. (2003) that stated that there is a significant positive relationship between trust and behavioral intention of using system.

Other results in the table 8 are a support for Technology Acceptance Model. It shows that perceived ease of use and perceived usefulness positively related to the behavioral intention of using the e-procurement system. Perceived ease of use is also related to perceived usefulness. Those findings support Davis's Model (1986 and 1989) and Gefen et al. (2003)

Conclusions and Recommendations

As we expected, we finds that risk and trust affect the behavioral intention of using e-procurement system. The relationship between risk and behavioral intention of using e-procurement is negative while trust is positive. It implies that the government should focus on minimizing risk and improving trust of e-procurement users by having good security system and trustworthy. Good security can be performed by scanning the system regularly and having security number when doing transaction to avoid lost data lost. Advertising is one of ways to increase trustworthy because advertising gives more information about data protection, transactions, procedures, and services of e-procurement. By advertising, users are expected to be more understood about e-procurement and do not need to be afraid using e-procurement. In the other words, high degrees of social presence can build trust because of decreasing disagreement or misunderstandings. It will increase behavioral intention of users to use e-procurement.

In this research, there are several limitations that should be taken into consideration. The first limitation is in term of the scope and number of samples. The scope of the samples taken in this research is limited only to e-procurement users in Yogyakarta, and it only employs 83 respondents as the samples. Thus, the researcher expects that the future research would employ more numbers and wider scopes of samples, for example gathering information from the government as a provider of e-procurement system. The next research also needs to add certain variable such as demographic characteristics (education, age, gender, and so on). Although this research already included some of the characteristics, but it did not examine the role of them further in the e-procurement system context.

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