

# Electronic Government Procurement Adoption Behavior amongst Malaysian SMEs

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## Abstract

The aim of this study is to investigate the relationship between a model of electronic procurement (e-procurement) adoption behavior and the level of Government e-procurement adoption amongst Small Medium Enterprise (SME) in Malaysia. Data was collected through questionnaires that were distributed to SME selected randomly in all SME in Malaysia. The data were analyzed using factor analysis, reliability analysis, independent-sample t-test, descriptive statistics, Pearson Correlation and multiple regressions. Regression results reveals that 'power', 'trust' and 'value' have a positive relationship with the level of e-procurement adoption amongst SME in Malaysia. All dimensions, namely; the power of supplier, power of procurement, trust on supplier, trust on information technology, value of implementation system efficiency and value of cost efficiency were also correlated with the level of e-procurement adoption amongst SME. Past studies on e-procurement are beset by problems of buyer-seller relationship perspective. In addition, these studies are skewed towards Government-SME relationship perspective which the Government possesses more power than SME and provide a better incentive to educate and influence SME to adopt e-procurement. In investigation the relationship between a model of e-procurement adoption behavior and the level of Government e-procurement adoption amongst SME in Malaysia, this study also tries to provides recommendation to Malaysian government for improving the level of e-procurement adoption amongst SME.

**Keywords:** Government procurement, Communication technologies, Electronic procurement and Malaysia

## 1. Introduction

As a response to the challenge of trade liberalization and globalization, the options available for conducting business electronically will continue to increase. Many developed country such as United State, Canada and Japan are implementing e-procurement. E-procurement refers to the use of integrated information technology systems for procurement functions, including sourcing, negotiation, ordering, receipt and post-purchased review (Croom and Brandon-Jones, 2007). In considering the large purchasing power of governments, e-procurement applied to public procurement presents opportunities for welfare gains that neither the private nor the public sector can afford to ignore (Egypt Ministry of Foreign Trade, 2002).

In all countries government is a substantial part of the national economy, and shifting its business activities of procurement and construction online has the potential to provide major impetus to the rollout of new technologies throughout the economy. However, the operational benefits of technology for the governance and efficiency of these business activities is beyond question. Installing new technology can be simple, but experience has shown that extracting maximum benefit involves governance, management, organizational and behavioral changes which are almost always complex (Asian Development Bank *et al.*, 2004). As an example, Malaysia has issued a statement calling for all 35,000 government suppliers to use its e-procurement system (Utusan Malaysia, 2008). Nearly all suppliers (e-procurement users) to the government have registered with e-procurement, but fewer than 18,000 electronic catalogue items have been uploaded to the system (Leatham, 2003). This means that they are alert about the system but they do not maximize the benefits.

Furthermore, the complexities and risks involved in e-procurement activities are frequently misunderstood and the seeds of failure often shown with the presumption that technology *per se* rather than management and culture are the

key (Asian Development Bank *et al.*, 2004). In this situation security and trustworthiness are the paramount active concerns preventing the wider adoption of e-procurement strategies. Fears over security are no less significant amongst those companies that already have substantial experience of e-procurement. Indeed, the more companies know about e-procurement, the more scared they are about security (PricewaterhouseCoopers, 1999).

The next issue that always been discussed is the adoption of e-procurement in Small Medium Enterprise (SME) (Gunasekaran *et al.*, 2009; Karjalainen and Kemppainen, 2008 and Chan and Lee, 2003). Base on American research (Castillo and Ferguson, 1997; Ferguson, 1995 and Grandona and Parson, 2004), their studies show that to provide values of electronic business, it must be adopted by a wide variety of companies, large or small, rich or poor, automation focuses and automation illiterate. However, converting SME to e-procurement or e-business as a whole is a huge task and to achieve the efficiency the companies really depend on effectiveness of initiative provided by the developer.

Awaking for the importance of SME participation on government e-procurement project, this study seeks to provide answer to some of the questions that related with e-procurement adoption amongst SME in the context of Malaysian environment. Thus, this study aims to investigate whether the 'power', 'trust' and 'value' form as factors that associated with e-procurement adoption amongst SME.

## 2. Literature Review

The benefits of the e-procurement are related to increased market transparency, lowering of transaction costs, additional information, and more competition (Carayannis and Popescu, 2005). Nevertheless, moving these technologies to core business processes is a challenging proposition. These changes affect management at all levels of the supply chain and potentially all businesses in the economy and need to be underpinned by appropriate legislation, infrastructure and training (Asian Development Bank *et al.*, 2004). Existing legacy systems are built around e-procurement technologies would need to be integrated with production-related systems. However, such an endeavor is costly not only in terms of money invested, but also in terms of time to implement the e-procurement technologies; most important, it is costly in terms of the risks involved in applying an uncertain technology to core business processes (Davila *et al.*, 2002). Moreover, according to Heck and Ribbers (1999), small firms with management that recognizes the benefits of the new system proposed will be more likely to adopt the system and enjoy higher impacts compared with firms with management that do not recognize the benefits of the system (Heck and Ribbers, 1999; Iacovou *et al.* 1995; Benbasat *et al.*, 1993).

For these reasons government should take the initiative to provide a context for the development and implementation of the system. The key issue here is the extent to which e-procurement systems are being developed so as to be compatible with a longer-term national government e-procurement strategy and integrated into an overall government e-procurement strategy (Asian Development Bank *et al.*, 2004). In which case, vendors should provide all procedural information, coaching, and hands-on experience to users before or on system procurement. This will furnish users with an operational knowledge of such systems, thereby creating some level of confidence in them to adopt the system. The result of this increase in knowledge and confidence in using the system will be a greater deployment of systems that provide the most support (i.e. more sophisticated systems with decision-making capabilities), thus, minimizing the extent of the "productivity paradox" (Ndubisi and Richardson, 2002). Similarly, Carayannis and Popescu (2005) suggested that a high professional standard on legislation and administrative framework and a high level of training and information access on suppliers are important to improve the efficiency, competitiveness, and responsiveness of e-procurement.

## 3. Research Methodology

The research model of this study is shown in figure 3.1. The model is replicated and adopted from Chan and Lee (2003). However, some modifications are made appropriate with the objective of the study and situation of SME in Malaysia. The level of government e-procurement adoption in Malaysian SME is referred to their full-use of the e-procurement systems. It can be measured through the frequencies of SME implement all four main module that has been provided by the developer which are central contract, direct purchase, quotation and tendering. The more they used the module the higher the level of e-procurement adoption among SME.

### 3.1 Hypotheses Development

Based on the literature review the following hypotheses were constructed:

#### 3.1.1 Power

According to Chan and Lee (2003) study, Ratnasingham (2000) defined power as "the capability of a firm to exert influence on another firm to act in a prescribed manner". The one, who possesses power over another party, possesses the ability to cause that party to do something that it would not otherwise have done. Chan and Lee (2003) stated that, the power that makes business adopt e-procurement comes from two sources: power of supplier and power of

e-procurement. Meanwhile the power of supplier will be described in two ways, the power of suppliers (government) over its buyer (SME) and the power of external pressure to SME. Chan and Lee (2003) stated that, the seller has power over the buyer when it is not easy to find a substitute for its good and service. Meanwhile based on the studied done by Heck and Ribbers (1999), they suggested that external pressure has a power to influence SME to adopt new system approached. Power of external pressure can be define as competitive pressure and the imposition by trading partners. As more competitors and trading partners become e-procurement capable, small firms are more inclined to adopt e-procurement in order to maintain their own competitive position. In a similar line of discussion, Knudsen (2003) reported that entry barriers, threat of substitution and rivalry among industry incumbents are examples of competitive forces in order to describe power in the industry conditions.

Further, the second determination of power is power of e-procurement. This power can be measured through the usefulness of the e-procurement technologies to the buyer. Ndubisi and Richardson (2002) stated that perceived usability is measured in how clear and understandable is the interaction with the system, ease of getting the system to do what is required, mental effort required to interact with the system and ease of use of system. If a party can find a substitute easily to replace e-procurement, the power of e-procurement perceived by that particular party is low. Business would not adopt e-procurement, and even if they did, the level of use is limited (Chan and Lee, 2003). Hence, the related hypotheses may be advanced as follows:

#### Hypothesis 1:

H<sub>1</sub>: There is a positive correlation between power and e-procurement adoption amongst SME

Since the power that makes business adopt e-procurement comes from two sources, namely power of supplier and power of procurement, thus it can be sub-hypothesized accordingly as follows:

H<sub>1A</sub>: There is a positive correlation between power of supplier and e-procurement adoption amongst SME

H<sub>1B</sub>: There is a positive correlation between power of procurement and e-procurement adoption amongst SME

#### 3.1.2 Trust

In terms of building trust, Chang and Wong (2010) claim that trust was the fundamental element that affected firms' willingness to participate. In a same argument, Chan and Lee (2003) reported that trust is an important factor to influence the pre and post adopters in adopting new systems. A transparent transaction process is a key driver for e-procurement. A fair and transparent auction process allows the buyer and seller to make their decisions effectively (Yu Y.W. *et al.*, 2008). PricewaterhouseCoopers (2002) explored the attitudes towards trust in e-procurement among European businesses. In their studies, they claimed that trust is still more important than price. Cost-savings alone will not influence companies to switch their suppliers online. Trust is built on relationships, brand and physical presence. In particular, SME are more vulnerable to external threat than their larger counterparts. Risk exists not only due to their unfamiliarity with their trading partners, but also due to their unfamiliarity with the technology that they are using. If they used electronic means to accomplish procurement, they have to suffer the possible risk of, for example, confidential information being eavesdropped on the network (Friedman B. *et al.*, 2000). On the other hand, Love *et al.* (2004) stated that security is the number one risk factor associated with IT investments for Australian SME. In a similar study,, according to Islamy (2002) there is a need to ensure that users online privacy is protected, both legally and technologically as this assurance will make them feel comfortable to surf the internet and more importantly to submit their data and spend their money online. The researcher added that the legislation is important because no matter how advanced the technology may be, without any legislation that regulates the rights and duties the technology can be abused.

Besides, the development of internet security system has also tremendously contributed to the better protection of online privacy. Thus, the second tools in determining the e-procurement adoption in SME are trust on suppliers and trust on information technology (IT). In this study, trust on supplier refers to government legislation to protecting online privacy whereas trust on IT refers to internet security system in protecting online privacy. Thus, the following hypotheses are posited as follows:

#### Hypothesis 2:

H<sub>2</sub>: There is a positive correlation between trust and e-procurement adoption amongst SME

Since trust comprising of two elements, trust on supplier and trust on information technologies, thus it can be sub-hypothesized accordingly as follow:

H<sub>2A</sub>: There is a positive correlation between trust on supplier and e-procurement adoption amongst SME

H<sub>2B</sub>: There is a positive correlation between trust on information technology and e-procurement adoption amongst SME

### 3.1.3 Value

Value of e-procurement adoption is defined in this study simply as benefits from its implementation over costs. "Perceived benefits" is a construct tied to an assessment of the gains that accrue to an individual or firm by using the technology (Ndubisi and Richardson, 2002). From the SME perspective, benefits of accessing electronic public procurement includes better sales volume and improve access to larger markets in many countries, acquire knowledge from technology transfer, potential for linkage with large business and potential for placed on the government list. Perceived system's benefits or usability is tied to an individual's assessment of the effort involved in the process of using the technology (Egypt, Ministry of Foreign Trade, 2002). Measures of Perceived system's benefits in this study are in term of reducing administrative costs, shortening the order fulfillment cycle time, lowering inventory levels and the price paid for goods, and preparing organizations for increased technological collaboration and planning with business partners (Croom, 2005; Gamble, 1999; Greenemeier, 2000; Murray, 2001 and Roche, 2001).

In terms of perceived cost benefits, procurement cost is made up of actual expenditure (on procurement goods and services) and process costs (transaction cost) (Chan and Lee, 2003). Measures of Perceived cost benefits in this study are in term of price benefits, transaction cost benefits and reducing in Technology Lock-in Costs. Price benefits comes from potential price reduction off average market price while transaction cost benefits result from savings in search, negotiation and contracting, and coordination costs. Technology lock-in costs are cost involve in choosing and using a specific procurement system, including switching costs, opportunistic behavior by contracted suppliers (Chan and Lee, 2002) and Shaw and Subramaniam, 2002). Chan and Lee (2002) stated that a firm is likely to perform procurement through electronic means if the perceived benefits are enough to cover the costs. Thus the next hypothesis is:

#### Hypothesis 3:

H<sub>3</sub>: There is a positive correlation between value and e-procurement adoption amongst SME

Since the value that makes business adopt e-procurement comes from two sources, namely value of implementation system efficiency and value of cost efficiency, thus, it can be sub-hypothesized accordingly as follow:

H<sub>3A</sub>: There is a positive correlation between value of implementation system efficiency and e-procurement adoption amongst SME

H<sub>3B</sub>: There is a positive correlation between value of cost efficiency and e-procurement adoption amongst SME

In this study, the combination of power, trust and value would also be tested. Hence the related hypothesis may be advanced as follows:

#### Hypothesis 4:

H<sub>4</sub>: The three independent variables will significantly explain the variance in level of e-procurement adoption.

Given the discussion above, the theoretical framework that proposes to explain the relationship between 'power', 'trust', 'value' and the adoption of e-procurement amongst SME is denoted by the following general expression:

$$A = f(P, T, V) \quad (3.1)$$

Where: A= Level of e-procurement adoption

P= Power, T= Trust, V= Value

The general expression can be stated in the form of regression equation as follows:

$$A = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \varepsilon \quad (3.2)$$

$\beta_1$ =Power,  $\beta_2$ =Trust,  $\beta_3$ =Value

### 3.2 Descriptive analysis of sample Population

The population of this study comprised of Small and Medium Enterprise in Malaysia in various industries that are listed in Small and Medium Industries Development Corporation Directory (SMIDEC) and registered with ePerolehan (Government e-Procurement). To ensure appropriate respondents, Account Manager/Executive who does apply government e-procurement daily will be surveyed. The population base is made up of 194 companies. Demographics of this survey focused on SME less than 500 employees. The SME are split into three groups according to number of employees (see table 1):

To get an appropriate respondent the sampling frame is based on two sources. First, in analyzing small and medium companies in Malaysia, a list of companies name and address are gathered from Small and Medium Industries Development Corporation Directory (SMIDEC). Then to confirm they are using government e-procurement, these data are matched with data gathered from e-procurement Registration Directory.

As for this research, the multivariate was used to observe the relationship between three variables, guidelines by Roscoe (1975) suggest a sample size of 30. Based on table provided by Krejcie and Morgan (1970), as reported by Sekaran (1992) a population of 190 suggests a sample size of 127 and a population of 200 suggests a sample size of 132. After considering the probability of unreturned and rejected questionnaire 150-structured questionnaire are distributed randomly to respondents. Details of the contact person are obtained from SMIDEC directory.

An appropriate questionnaire with a cover letter has been sent by mail/e-mail to each Account Manager/Executive of the company. The questionnaire is adopted and adapted from Asian Development Bank *et al.* (2004) and Morrell *et al.* (1995) but some amendment was made appropriate with the objective of the study and situation on Small and Medium Industries in Malaysia. To get a clear picture on SME phenomena, additional information about organizational background and respondent's perspective regarding government incentive were asked while filling up the questionnaire. The questionnaire has 84 items of questions and contains five sections (see table 2):

The questionnaire has been evaluated by pilot test to reveal draft questionnaire error, look for control problem and scan the environment for factors that might confound the results. Face-to-face interview has been made to get their comments and valuable feedback regarding unclear statement and instructions, and also unfamiliar term to them. The questionnaires are then modified according to the respondent's feedback. This new questionnaires are used to collect the actual data for the study.

### 3.3 Validity and Reliability

In order to achieve the content validity of the research instrument, the table of operational dimensions and items are presented to academic supervisor to be judged and examined. In addition, according to Sekaran (1992), the information obtained from the study should be as free as possible of bias. Bias refers to errors or inaccuracies in the data collection. Respondent bias could be a threat to the validity on the results of the study. For these reasons, a bias test has been conducted between respondents who responded by e-mail and respondents who responded by mailed. Based on this test, a comparison of the means of the variables found little difference between respondents who responded by e-mail and respondents who responded by mailed. The *t*-value for only two variables is significant, but this is not believed to be a serious problem (and could be due to chance). The other 15-variables have *t*-value less than 1.3 with significance greater than 0.20. Based on these results, it could be concluded that there is unlikely to be a systematic bias due to differences between those who responded by e-mail and who responded by mailed.

Besides that, this research also tested on reliability of the data collected. A Principle Components Analysis was conducted to examine the reliability of the items in each dimension. In order to determine whether the instruments of this study were reliable or not the internal consistency was calculated by using Cronbach's Alpha approach. Table 3 presented the result of reliability analysis of each variable. From the analysis, it shows that the alpha value of each dimensions are ranged between 0.60 and 0.94 whereas the dependent variable represented total alpha of 0.627. In overall the internal consistency of the instruments can be considered as good or high reliability.

## 4. Results

This finding provides the results of data analysis with regard to achieve research objective. The results of the research model with hypotheses are presented. Descriptive analysis and inferential analysis are used for the above purpose. The accurate statistical method such as Correlation Pearson and Multiple Regression are used to determine the relationship between independent variables and e-procurement adoption amongst SME.

### 4.1 Measures of Central Tendencies and Dispersion

Descriptive Statistics is used to analyze the interval-scaled independent and dependent variables. Sekaran (1992) pointed out the importance of these statistics as to indicate whether the responses range over the scale. The mean, the range, the standard deviation, and the variance in the data will give the researcher a good idea of how the respondents reacted to the items in the questionnaires and how good the items and measures are.

All variables have been tapped on a five-point scale. As shown in table 4, the mean on dependent variable (e-procurement adoption) of 2.44 is rather low, below average on a five-point scale. Similarly, the mean on all independent variables and its dimensions except the power of supplier, is rather low (less than average – 2.97 on a five point scale) whereas, the mean of power of supplier is about average (3.08 on a five point scale).

### 4.2 Correlations among Research Variables

Table 5 represents the Pearson correlation coefficient between all independent variable and dependent variable and between all dimensions of independent variable and dependent variable. Examination of the correlation coefficient of all independent variables and all dimensions revealed statistically significant correlation with e-procurement adoption.

However, there are some of the predictor variables that are not correlated with other predictor variables. The correlation coefficients are ranging from 0.176 to 0.850 with  $p < 0.01$ , except value of cost which  $p < 0.05$ . The relatively high correlation between two or more independent variables signals the presence of multicollinearity when applying regression analysis to test the models. (Cooper and Schindler, 2003). But when we run multiple regressions, the condition index, variance influencing factor (VIF) and tolerance all fall in the acceptance range. Therefore there was no presence of multicollinearity in the model used for this study.

#### 4.3 Factors affecting e-procurement adoption

In line with the fourth specific research objective, this subsection aims to provide answer for the differential effect of the relationship between joint contribution of independent variables and e-procurement adoption amongst SME. Multiple regression analysis is used to identify which among the independent variables most important in explaining the variance in e-procurement adoption.

Before proceed with the regression analysis, the independent variables were checked for the presents of multicollinearity. Table 6 presents the result of Collinearity Diagnostics. From the table presented, there was no support for the existence of severe multicollenearity in this analysis. The variance inflation factors (VIF) in predictor variables are on the range of 1.237 and 1.997, which was well below the threshold (VIF = 10) has been suggested by Hair *et al.* (1995) and Cooper and Schindler (2003). This conclusion was further supported by the results of variance proportions that less than two coefficients accounted for 0.900 and above.

The next step of this analysis is the regression analysis. The result (see Table 7) revealed that there is a positive and highly significant, with  $F = 128.7705$  and  $p < 0.0001$  in the relationship between combination of the three independent variables and e-procurement adoption amongst SME.

Overall, analysis of the goodness and fit for the regression equation developed in chapter three showed that the coefficient of determination,  $R^2 = 0.755$ , signifying that 75.5% of the variation in the level of e-procurement adoption amongst SME significantly explained by the regression equation. The beta of both, Power and Trust are found significantly correlated with level of e-procurement adoption amongst SME. The highest beta of Power ( $\beta = 0.620$ ) indicates that the factor of power is most significant in explaining level of e-procurement adoption amongst SME, and it is followed by factor of Trust ( $\beta = 0.323$ ). Thus, the general expression in the form of regression equation can be stated as follows:

$$A = 0.136 + 0.620P + 0.323T - 0.072V + \varepsilon \quad (5.1)$$

At this point it should be noted that the successful multiple regression analysis is dependent upon the assumptions of homogeneity of variance, normality and linearity among variables. In order to evaluate the homogeneity of variance of the residuals, the standardized residual were plotted against the fitted dependent variable (e-procurement adoption). Given the absence of any systematic feature in plot, there was no evidence to suggest that assumption of homoscedasticity had been violated. In addition, all the data points in each predictor fall within a horizontal band of uniform width about a zero midpoint, suggesting that a linear relationship adequately represents the effect of each predictor. Finally, in order to test the normality of residuals, the normal scores are plotted. Further, the straight-line points plotted in the normal probability plot suggested that there was no departure from normality. Further, the histogram of standardized residuals revealed that the distribution does not depart dramatically from normal distribution.

## 5. Discussions on Findings

This section reviews the discussion literature found in section two and three, and compared it with the findings of this study. The possible reasons behind any difference are suggested and discussed.

### 5.1 The possible relationship between 'power' and e-procurement adoption amongst SME

The result of this study that shows a positive relationship between all dimensions in power and level of e-procurement adoption amongst SME is parallel with the research conducted by Chan and Lee (2003). Chan and Lee (2003) claimed that, it is anticipated that the supplier possesses more power if the buyer is a small company (in this study majority of the respondent are from small enterprise). Consequently, the small buyer has to follow the supplier's requests, such as adopting electronic procurement, as it is not the power-holder. Similarly, power also comes from the technology itself. If a substitute can be found easily to replace e-procurement, the power of e-procurement perceived is low. Business would not adopt e-procurement, and even if they did, the level of use is limited.

Further, correlation coefficient differential between this study and that of Chan and Lee (2003), have led to further discussions. Chan and Lee (2003) found that there is not as significant as expected in the relationship between power of suppliers and level of e-procurement adoption. However, the results in this study demonstrated that power of supplier is significant at the value of  $p < 0.01$ . Thus, power of suppliers is highly correlated with the e-procurement

adoption amongst SME. The possible reasons behind the different might be the characteristic of the sample chosen. Chan and Lee (2003) sample were drawn from a variety of supplies supplying e-procurement to SME, but this study involved only government (who is a monopoly supplier) as the e-procurement supplier to SME. According to Knudsen (2003), monopoly power can impede competitive forces and increase the market power. Since the government is a power-holder in government procurement, it is not easy to find a substitute of e-procurement when dealing with government. As example, all suppliers registered with Ministry of Finance are required to register with government e-procurement via online. However, this finding is still parallel to the research conducted by Iacovou *et al.* (1995), Heck and Ribbers (1999), Chwelos *et al.* (2001) and Knudsen (2003); who found that external pressure has influence the users adoption behavioral.

Moreover, the second dimension of power is power of e-procurement. From the results, the positive and significant different between powers of e-procurement and e-procurement adoption amongst SME are parallel to the results gained by Chan and Lee (2003) and Ndubisi and Richardson (2002). This means that the high (low) power of e-procurement will determine the high (low) of e-procurement adoption amongst SME. Malaysian SME found that there is no better substitute of e-procurement in government procurement.

### 5.2 The possible relationship between 'trust' and e-procurement adoption amongst SME

Results from hypothesis testing indicated that there is a positive and significant different between trust and e-procurement adoption amongst SME. This means, the high (low) level of trust will determine the high (low) the e-procurement adoption amongst SME. This results is parallel to the research conducted by Chan and Lee (2003), who claimed that business buyers perform differently based on their own level of risk perception (or the level of trust). This ultimately will affect their intention of e-procurement adoption and the acceptance level; and PricewaterhouseCoopers (2002) who claimed that trust is still more importance than price.

However, in the dimensions of trust although the result from this study shows that there is a positive and significant correlation between trust on supplier and e-procurement adoption Malaysian SME, but it is in a low coefficient correlation value. This finding is contradicted to the research conducted by Chan and Lee (2003) who claimed that trust on suppliers is ranked second in terms of significance in affecting e-procurement adoption by SME. The possible reasons behind the different might be the medium and low understanding of Malaysian SME on supporting legislations, policies and procedure guideline provided by government and the weaknesses of the legislations. According to Ndubisi and Richardson (2002) increase in knowledge will be a greater deployment of systems that provide the most support (i.e. more sophisticated systems with decision-making capabilities), thus minimizing the extent of the "productivity paradox". Furthermore Islamy (2002) stated that In Malaysia, there is no specific legislation that has been enacted to provide the protection for the right to privacy. The existing law in Malaysia does not provide sufficient remedy for breach of privacy in its broad aspect.

In addition, the second dimension of trust, which is trusts on information technology this study shows the highest correlation coefficient value of 0.850. This positive and significant correlation value shows that there is a positive and significant relationship between trust on information technology and e-procurement adoption amongst SME. This finding is parallel to the research conducted by Chan and Lee (2003) who had respectively verified that trust on the technology is a significant factor that affects the intention to adopt e-procurement, as well as Love *et al.* (2004) which claimed that security is the number one risk factor associated with IT investments for SME, Chang and Wong (2010) who stated that trust was the fundamental element that affected firms' willingness to participate and Islamy (2002) who claimed that there is a need to ensure that users online privacy is protected, both legally and technologically as this assurance will make them feel comfortable to surf the internet and more importantly to submit their data and spend their money online.

### 5.3 The possible relationship between 'value' and e-procurement adoption amongst SME

The result of this study that shows a positive relationship between all dimensions in value and e-procurement adoption amongst SME is parallel with the research conducted by Iacovou *et al.* (1995), Chan and Lee (2003) and Croom (2005). However there is a differential result on correlation coefficient value between this study and that of Chan and Lee (2003).

Chan and Lee (2003) found that there is a significant relationship between value of e-procurement and the level of e-procurement adoption behavioral. However, this study demonstrated that value of implementation systems efficiency is significant but in a low coefficient, while value of cost efficiency is not significant as expected. Thus value of implementation systems efficiency is less important in explaining the level of e-procurement adoption amongst SME. While for the cost efficiency, none of the firms interviewed consider value of cost efficiency as an important factor driving them to adopt e-procurement.

The possible reasons behind the different might be first, Malaysian SME face a significant constraints on cost, second the decisions supports systems in e-procurement is not enough to supports decisions made by SME adopter and the third reasons is the results of less effectiveness on government tactic and minor inhibitor to success in government incentive, may led to effect the relationship between value and e-procurement adoption amongst SME.

However, this study is in line with those study carried out by Kuan and Chau (2001), who found that perceived indirect benefits were not found to be a significant factor, as well as Egypt Ministry of Foreign Trade (2002), which claimed costs constraints hindering SME participation in public procurement, Heck and Ribbers (1999) who claimed that higher managerial understanding of the relative advantage of the system increases the likelihood of allocation of the managerial, financial, and technological resources necessary to implement an integrated the system and others prior research (e.g. Ndubisi and Richardson (2002); Bergeron *et al.* (1990) have shown that systems are more successful when there was user computing support.

#### 5.4 The Factors Associated with the Adoption of E-Procurement amongst SME

From the results of equation model (5.1) stated in previous chapter, power is the most important factor in explaining the adoption of e-procurement amongst SME. This is followed by trust and value. Thus government should consider these three factors in order to motivate SME to maximize the use of government e-procurement system.

### 6. Recommendations

The study has extended to the profession of Accounting Information System and growing interdisciplinary live of research dealing with investigation into the potential determinations apart of e-commerce environment, in this instance is the government e-procurement and SME application.

Methodology improvement has been made to investigate the ability to predict and measure the e-procurement adoption amongst SME as a response to the research done by Chan and Lee (2003). Additional items to the existing measurement were made. To capture the information, structured self-administration questionnaire was adopted with regards to the population of whole SME in Malaysia, whereas majority previous e-procurement studies adopted case study to gather the information.

However, there is a limitation in getting literature review according to e-procurement adoption in Malaysian SME because the government e-procurement system is still new in the industries especially SME companies and lack of researched analysis had been done. Secondly, it is difficult to get feedback from respondents' because of scenario in Malaysian citizen, which lack intention in usefulness of research analysis.

Base on the above discussion and implication, some practical measures are recommended:

#### i) Assessment on training and education on procurement and system process

Assessment on training need and education need are important for the government to ensure SME can increase their understanding on the usefulness of the system. In addition, government should give additional information to SME regarding procedures, policies and legislations that have been implemented in government e-procurement, especially information on their rights on privacy and legal online protection.

#### ii) Revisions of policies, regulations and legislations systems

Government should revise its policies, regulations and legislations systems so that it can give a clear translation and wider support legislation procurement issues. The systems should be preferably designed around common platforms or at least common open standards but retain flexibility to be customized around the individual business processes of each agency or decision points within agencies.

#### iii) Revisions on supporting system

Government should revise the decision supporting systems provided in e-procurement to make it more meaningful to Malaysian SME management information for decision making about procurement methodologies ranging from spot purchasing, fixed term contracts, multi-agency aggregation or even outsourcing.

#### iv) Revisions on government incentive

Government should revise its assistance programmers in terms of financial assistances and technical assistances. Especially survey regarding e-procurement capability, increase the function of e-procurement 'Help desk', e-procurement users group and establish e-procurement conferences, arranged discounts on e-procurement software and hardware and lastly personally visited respondent company. These assistants are important to ensure that Malaysians SME will always follow any changes in information technology.

Future research undertakings are recommended for the purposes of clarifying three unanswered problems:



1. Test the relationship between decision support systems provided and quality of government e-procurement.
2. Further study on the effectiveness of government incentive.

### 7. Conclusion

The results have proved that power; trust and value are the factors that associated with SME to adopt government e-procurement. Between the two dimensions of power, power of procurement was found to be most important factor in explaining the level of e-procurement adoption amongst SME. Therefore, government should take into account on how to improve the ease of use and perceived usefulness of procurement. In term of trust, since the results suggested that trust on supplier give a low correlation, the existing legacy systems should be revised so that it can provided a high professional standard on legislation and administrative framework and support the transparency, efficiency, integrity and consistency throughout the procurement process, while providing realistic incentive on trust to supplier and IT. In term of value, it is important for both government and SME, to work together and plan the alternative way in benefited the system. This will furnish SME with an operational knowledge of such systems, thereby creating some level of confidence in them to adopt the system. In short, this study suggested a considerably high possibility of success for government in motivating the SME to adopt e-procurement if the mentioned-above efforts carried out with care.

### References

- Asian Development Bank, Inter-American Development Bank and World Bank (2004). Strategic electronic government procurement - strategic overview: an introduction for executives. Washington, DC: World Bank.
- Carayannis, E.G. & Popescu, D. (2005). Profiling a methodology for economic growth and convergence: Learning from the EU e-procurement experience for central and eastern European countries. *Technovation*, 25, 1–14.
- Castillo, S.W. & Ferguson, D.M. (1997). Key e-business best practice and trends. *Journal of Electronic Commerce*. Founding Issues, 15-23.
- Chan, J.K.C. & Lee, M.K.O. (2003). SME e-procurement adoption in Hong Kong - The roles of power, trust and value. *IEEE Computer Society*. Proceedings 36<sup>th</sup> Hawaii International Conference on System Sciences. 1-10.
- Chang H. H. & Wong K. H. (2010). Adoption of e-procurement and participation of e-marketplace on firm performance: Trust as a moderator. *Information Management*. Vol.47, 5-6, 262-270.
- Chua, P.Y., Naiyi H., Lee F.W. & Chen C.W. (2004). Exploring success factors for Taiwan's government electronic tendering system: Behavioral perspectives from end users. *Elsevier*. Vol. 21, 219–234.
- Chwelos, P., Benbasat, I. & Dexter, A. (2001). Research report: Empirical test of an EDI adoption model. *Information Systems Research*. Vol. 12, 3, 304–321.
- Cooper, D.R. & Schindler, P.S. (2003). *Business Research Methods* (8<sup>th</sup> ed.). Singapore: McGraw-Hill Book Co.
- Croom, S.R. (2005). The impact of e-business on supply chain management: An empirical study of key developments. *International Journal of Operations & Production Management*. Vol. 25, 1, 55-73.
- Cuthbert, C., Hamzic, D. & Archer, N. (2003). Barriers to SME e-procurement solutions in Canada: A survey. *McMaster eBusiness Research Centre (MeRC)*. McMaster University: (Working Paper 7).
- Davila, A., Gupta, M. & Palmer, R. (2003). Moving procurement systems to the internet: The adoption and the use of e-procurement technology model. *European Management Journal*. Vol. 21, 1, 11-23.
- Egypt Ministry of Foreign Trade (2002). Developing a procurement reform program supporting SME development in Egypt: A background study. *Ministry of Foreign Trade*, Egypt.
- Ferguson, D.M. (1995). Financial EDI: A required business practice before the turn of the century. *Journal of Electronic Commerce*. Founding Issues, 14-17.
- Grandona, E.E. & Pearson, J.M. (2004) Electronic commerce adoption: An empirical study of small and medium US businesses. *Information & Management*. Vol. 42, 197–216.
- Guilford, J. P. & Frunchter, B. (1978). *Fundamental statistics in psychology and education*. Singapore: McGraw-Hill Book Co.
- Gunasekaran, A., McGaughey, R.E., Ngai, E.T. & Rai, B.K. (2009). E-procurement adoption in the Southcoast SMEs. *International Journal Production Economics*. Vol. 122, 161-175.
- Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. (1995). *Multivariate data analysis* (4<sup>th</sup> ed.). New Jersey: Prentice-Hall.

- Heck, E.V. & Ribbers, P.M. (1999). The adoption and impact of EDI in Dutch SME's. *IEEE Computer Society. Proceedings 32nd Hawaii International Conference on System Sciences*. 1-9.
- Hill, N.C. & Ferguson, D.M. (1995). EDI and payment terms: Negotiating a positive-sum game. *The Journal of Electronic Commerce*. Founding Issues, 1-5.
- Iacovou, A.L., Benbasat, I. & Dexter, A. (1995). Electronic data interchange and small organizations: Adoption and impact of technology, *MIS*. 465–485.
- Igbaria, M., Zinatelli, N., Cragg, P. & Cavaye, A. (1997). Personal computing acceptance factors in small firms: A structural equation model. *MIS*. (September, 1997). 279–302.
- Islamy, H.E. (2002). Privacy on the internet and legal protection. *Internet Economy and Business*, Proceedings of International Conference. Kuala Lumpur, Malaysia.
- Karjalainen, K. & Kempainen, K. (2008). The involvement of small- and medium-sized enterprises in public procurement: Impact of resource perceptions, electronic systems and enterprise size. *Journal of Purchasing & Supply Management*. Vol. 14, 230-240.
- Karkoviata, L. (2001). SME reluctance to go online. *Asian Business*.
- Knudsen, D. (2003). Aligning corporate strategy, Procurement strategy and e-procurement tools. *International Journal of Physical Distribution & Logistics Management*. Vol. 33, 8, 720-734.
- Kuan, K. & Chau, P. (2001). A perception-based model of EDI adoption in small businesses using technology–organization–environment framework. *Information and Management*. Vol. 38, 507–521.
- Leatham, S. (2003). Global e-government. [Online] Available: <http://www.electricnews.net/enn.rss>
- Love, P., Zahir Iranib, Standinga, C., Lina, C. & Burna J.M. (2004). The enigma of evaluation: Benefits, costs and risks of IT in Australian small–medium-sized enterprises. *Information & Management*.
- Morrell, J.A., Neal W. & Fries V. (1995). Promoting electronic data interchange: Building a foundation for Support to Small Business. [Online] Available: [http://www.jamorell.com/EDI\\_survey/finalrpt.pdf](http://www.jamorell.com/EDI_survey/finalrpt.pdf)
- Ndubisi, N.O. & Richardson, S. (2002), Facilitators for the use of decision support systems in small and medium scale businesses: Suggestions for marketing strategy redefinition. *Internet Economy and Business*. Proceedings of International Conference. Kuala Lumpur, Malaysia.
- Presutti J. W. D. (2003). Supply management and e-procurement: Creating value added in the supply chain. *Industrial Marketing Management*. Vol. 32, 219– 226.
- PricewaterhouseCoopers. (1999). SME electronic commerce study Asia Pacific Economic Cooperation (APEC). Final Report.
- PricewaterhouseCoopers. (2000). Trust...Not Built At e-Speed: Trust issues in European B2B e-procurement. Final Report.
- Ratnasingham, P. (2000). The influence of power trading partner trust in electronic commerce, *Internet Research*. Vol. 10, 1, 56-63.
- Ratnasingam, P. & Pavlou, P. (2002). Technology trust: the next value creator in B2B electronic commerce. International Resources Management Association Conference. Washinton: Seattle.
- Riemenschneider, C.K., Harrison, D.A. & Mykytyn, P.P. (2003). Understanding IT adoption decisions in small business: Integrating current theories. *Information and Management*. Vol. 40, 269–285.
- Sekaran (2000). Research method for business. A skill building approach. New York: John Wiley & Sons.
- Thong, J.Y.L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*. Vol. 15, 4, 187–214.
- Utusan Malaysia (2008). E-Perolehan Tingkatkan Kualiti Perkhidmatan Kerajaan. Utusan Malaysia: Article.
- Yu Y. W., Yu H. C., Itoga H. & Lin T.R. (2008). Decision-Making factors for effective industrial e-procurement. *Technology in Society*. Vol. 30, 2, 163-169.

Table 1. Size of SME Companies

• < 20	Micro Enterprises
• 20-99	Small Enterprises
• 100-499	Medium Enterprises

Source: PricewaterhouseCoopers (1999)

Table 2. Question Arrangement

<b>Section A:</b> Respondent's Organisational Information	Question 1-6 This information is important to know the size of the company, nature of business, primary internet access, company experience, knowledge and perception.
<b>Section B:</b> Level of ePerolehan Adption	Question 1- 2 To collect the information of their level of adoption
<b>Section C:</b> Factors that Influences ePerolehan Adoption in the Company	Question 1-5 Test power of supplier Question 6-11 Test power of procurement Question 12-13 Test trust on supplier Question 14-15 Test trust on Information Technology
<b>Section D:</b> Implement System and Cost Efficiency	Question 1-9 Implementation systems efficiency Question 10-16 Cost efficiency
<b>Section E:</b> Government Incentive	Question 1: 1-6 Government tactics to influence SME implement the system Question 2: 1-9 The success or failure of the e-procurement

Table 3. The Result of Reliability Analysis

Measures of Independent Variable	Cronbach's alpha (Independent Variable)	Measures of Dimensions	Cronbach's alpha (Dimensions)
Power	0.762	Power of supplier	0.713
		Power of procurement	0.906
Trust	0.605	Trust on supplier	0.627
		Trust on IT	0.908
Value	0.865	Value of implementation system efficiency	0.936
		Value of cost efficiency	0.908
		Overall	0.875
<b>Measures of Dependent Variable</b>		<b>Cronbach's alpha (dependent Variable)</b>	
e-procurement Adoption		0.627	

Table 4. Measures of Central Tendencies and Dispersion (n=129). Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable: Level Adopt	1.67	3.83	2.44	0.58913
Independent Variables:				
Power	1.82	4.36	2.80	0.54023
Power Supplier	1.60	5.00	3.08	0.79380
Power Procurement	1.50	4.50	2.57	0.69932
Trust	1.00	4.50	2.38	0.74681
Trust Supplier	1.00	5.00	2.33	0.92807
Trust IT	1.00	4.50	2.43	1.07184
Value	1.93	4.21	2.75	0.48634
Value IS	1.57	4.29	2.52	0.65058
Value Cost	1.86	4.14	2.97	0.68054

Table 5. Pearson Correlations Coefficients (n=129)

Variables	1	2	3	4	5	6	7	8	9	10
1. e-proc.Adopt	1									
2. Power	.809(**)	1								
3. Power Supp.	.549(**)	.709(**)	1							
4. Power Proc.	.627(**)	.745(**)	.059	1						
5. Trust	.764(**)	.652(**)	.373(**)	.570(**)	1					
6. Trust Supp.	.248(**)	.231(**)	.257(**)	.084	.701(**)	1				
7. Trust IT	.850(**)	.708(**)	.297(**)	.722(**)	.787(**)	.111	1			
8. Value	.299(**)	.438(**)	-.032	.650(**)	.267(**)	.023	.353(**)	1		
9. Value IS	.262(**)	.492(**)	-.101	.792(**)	.269(**)	.026	.353(**)	.716(**)	1	
10. Value Cost	.176(*)	.155	.051	.171	.125	.008	.167	.745(**)	.067	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Table 6. Collinearity Diagnostics

Variables	Collinearity Statistics		Condition Index	Variance Proportions			
	Tolerance	VIF		(Constant)	Powers	Trust	Values
Power	0.500	1.997	8.347	0.071	0.000	0.591	0.078
Trust	0.574	1.739	16.043	0.710	0.010	0.006	0.850
Value	0.807	1.237	17.161	0.216	0.988	0.398	0.069

Table 7. Regression Results with e-procurement Adoption as Dependent Variables (n=129)

Variables	Coefficient	Std. Error	Beta	t-Stat	Significance
(Constant)	0.136	0.169		0.804	0.422
Power	0.620	0.068	0.568	9.096	0.000 <sup>a</sup>
Trust	0.323	0.046	0.410	7.026	0.000 <sup>a</sup>
Value	-0.072	0.060	-0.060	-1.215	0.226

R<sup>2</sup> = 0.755; Adjusted R<sup>2</sup> = 0.749; F-ratio = 128.7705; Significant F = 0.000; a) p<0.0001

The four components are discussed in details below.

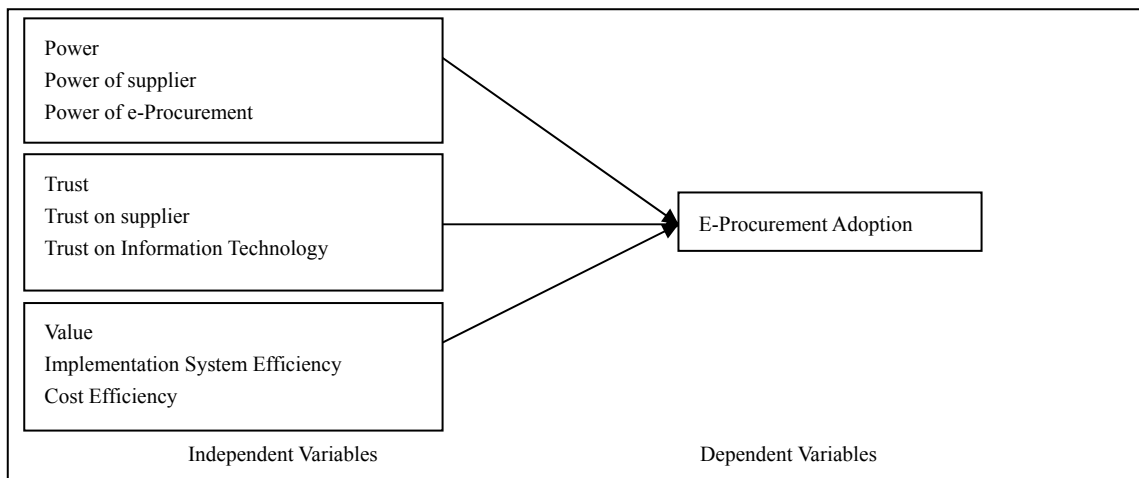


Figure 3.1. Electronic Procurement Adoption Model amongst SME

Source: Adapted from Chan and Lee (2003)