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Adoption of Innovative Information Systems by SMEs: Comparing The Role of Firm's Enacted Capabilities of Active Adopters and Non-Active Adopters

Noor Akma Mohd Salleh
Faculty of Business and Accountancy, The University of Malaya, Malaysia, akmasalleh@um.edu.my

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The adoption of innovative information systems (IS) by small-and medium-sized enterprises (SMEs) across heterogeneous culture, locales, and markets are a critical and an ongoing challenge. Such challenge requires more than just good ideas and extensive resources. It requires organisational capabilities that can be labelled as "enacted capabilities". This study defines enacted capabilities as the firm's ability to mobilise and deploy IS-based resources in combination or co-present with other capabilities within SMEs. Consequently, the aim of this study is to make a contribution by empirically examining the enacted capabilities of SMEs in developing countries that may influence the success of innovative IS adoption. In line with this objective, an innovative IS adoption behaviour investigation is conducted particularly as to why some SMEs are able to be enabled for use and utilise innovative IS, while others fail to do so. A survey of 206 of the CEOs/owners from Malaysian SMEs was conducted. The innovative IS examined was the government's electronic procurement systems. The findings are consistent with the notion that all SMEs have enacted capabilities. Some SMEs integrate and coordinate them in a different way, depending on the context of each organisation. The findings also indicate that strong enacted capabilities and perceived net benefits affect the SMEs' ability to perform or assimilate IS related strategic change.

Keyword: innovative information systems, enacted capabilities, adoption behaviour

Introduction

Developing countries would like to emulate the economic performance of developed countries (Zhouying, 2005; Romijn 2001). The rapid pace of globalisation, however, has created both economic and technological gaps between developed and developing countries. Small and medium-sized enterprises (SMEs) in developed countries, as opposed to their developing counterparts, tend to have access to institutional, organisational, financial, and managerial leverage. Access to these leverages allows the SMEs in developed countries to rapidly translate high-tech ideas into processes that help them become competitive players in the global market (Zhouying, 2005; Romijn, 2001). On the other hand, SMEs in developing countries rarely benefit from technology transfer because of the low efficiency they exhibit in absorbing the technologies acquired (Romijn, 2001). Low efficiency in technology absorption results mainly from the incompleteness of technology environment in these developing countries (Zhouying, 2005).

In a bid to encourage SMEs' to enter the world of on-line business, the Malaysian government has issued a directive which states that all direct purchase, quotation, and tenders must be submitted via the federal government electronic procurement systems. Thus, all SMEs interested in becoming or remaining government suppliers must register and be electronic procurement enabled. The system known as *ePerolehan* was launched in December 2002. Over sixty thousands SMEs have registered for this system. Since it first launched in 2002, there has been only a slight increased in the numbers of SMEs that are *ePerolehan* enabled as recent statistic obtained for 2005 indicates about 7,773 are *ePerolehan* enabled and about one third of the 7,773 are active users (CommerceDotCom Sdn. Bhd. Database, 2005).

A number of possible explanations exist for this lack of adoption/utilisation. *First*, Malaysia, like many Asian countries, tends to be less technologically developed, than their Western counterparts (Kendall et al., 2001). As such, SMEs in Malaysia are still new to the experience of exploiting innovative information systems. *Second*, there is a lack of a successful, locally based, on-line business model. Other explanations could include lack of funds, lack of confidence, lack of trust, lack of appropriate organisational culture.

Consequently, the aim of this study is to make a contribution by empirically examining factors that may influence the success of innovative IS adoption by SMEs in developing countries. Although there are IS adoption behaviour research conducted in developing countries (e.g., Chan and Lee, 2002; Kendall et al., 2001), there is still a dearth of knowledge providing an understanding of the determinants that activate and stimulate SMEs adoption behaviour within developing nations. Examining these issues within developing countries is critical if these nations are to successfully compete within a globalise economy. By focusing on developing countries, this paper aims at extending the theory development of the adoption of innovative IS to developing economies.

Prior Studies

An increasing number of studies have examined various factors that influence the adoption of innovative IS (e.g., Ratnasingham, 2003; Srinivasan et al., 2002; Igbaria et al., 1997). The Technology Acceptance Model (TAM) presented by Davis (1989) has been used extensively for IS adoption research at the individual level (Davis et al., 1989). TAM theorises that an individual's behaviour intention to use IS is determined by two beliefs: (1) perceiveness usefulness and (2) perceived ease of use (Davis et al., 1989). The core of TAM states that perception of usefulness and ease of use will influence an individual's intention to use IT, which ultimately influence actual usage behaviour through the mediating attitude construct (e.g., Bhattacherjee and Premkumar, 2004; Karahanna et al., 1999; Venkatesh et al., 2002).

Nonetheless, one of the limitations of TAM is its assumption that usage is voluntary. This assumption means there are no barriers preventing an individual from using innovative IS, if the individual chooses to do so (e.g., Venkatesh et al., 2002; Davis, 1989). While TAM have been consistently supported the innovative adoption behaviour for volitional context (Davis, 1989), it is not clear if the same relationships will hold when the behaviour model is mandatory. Many large organisations have exercised pressure on SMEs to adopt inter-organisational IS (e.g., Chau & Jim, 2002; Iacovou et al., 1995). External pressure to adopt innovative IS, and thus the removal of the "truly voluntary nature of adoption" implies that TAM may not provide a complete prediction and explanation of adoption behaviour by these enterprises.

Prior research into adoption by SMEs reveals that SMEs are concerned that the technologies they adopt are consistent with the firm's values and technology needs (Lee, 2004). SMEs decide to adopt IS because of a particular enterprise's individual characteristics, i.e., CEO innovativeness, CEO attitude, and CEO skills and knowledge and organisational characteristics, i.e., competitiveness of environment and information intensity (Thong, 2001). Thus, SMEs adopt Internet technologies for the reason of relative advantage perceived by the owners or top managers (Thong, 2001). A limitation of these studies, however, is that they provide an understanding of the contextual factors that provide a simple dichotomous measure such as adopters and non-adopters, rather than the form or dimension of adoption, i.e., from initial adoption to enabling for use to actively utilising the IS (Chin and Marcolin, 2001).

Recent studies indicate that SMEs' reluctance to adopt IS can be attributed to resource poverty, such as lack of financial and technological resources, internal expertise, skills and knowledge (e.g., Scupola, 2003; Chau and Hu, 2002). Studies related to resource issues have found that businesses with certain CEO characteristics are more likely to adopt the innovative IS (e.g., Thong, 2001). Interestingly however, while the CEO characteristics affect the decision to adopt, they do not affect the extent of adoption (e.g., Thong, 2001). Other resource issues, such as the characteristics of the individual

making the usage decision, support from external expertise and system attributes have also been identified as affecting the adoption behaviour (e.g., Lee, 2004). Some of these studies have linked resource availability to intentions to use the innovative IS (e.g., Chau & Hu, 2002).

More recently, a firms' technological opportunism has been introduced as an important determinant of innovative IS adoption (e.g., Scupola, 2003; Caldeira and Ward, 2003; Srinivasan et al., 2002). Within this context, managers possess the capability to respond to new opportunities by acquiring knowledge and understanding them. The more knowledge and understanding they acquire in relation to a particular system the more likely they are to adopt and utilise that system (Srinivasan et al., 2002; Mata et al., 1995).

Theoretical Foundation and Hypothesis Development

When the external environment is rapidly evolving, an internal perspective, such as the resource-based approach, may provide a stable basis on which to make strategic decisions (Narayanan, 2001). In other words, when the market place is in transition, such as during the diffusion of new IS, it is difficult to look outward for direction in making strategic decisions. Dealing effectively with such a challenge requires more than just good ideas and extensive resources. It also requires organisational capabilities in what may be labelled 'enacted capabilities'. These enacted capabilities are informed by the resource-based view of the firm (Barney, 1991).

A firm's resources may include both tangible and intangible assets including competencies, organisational processes, firm attributes, information, and knowledge. These resources are controlled by the firms and enable the firms to conceive and implement strategies that improve its efficiency and effectiveness (e.g. Bharadwaj, 2000; Barney, 1991). Extending this view of internal resources and/or capabilities to an IS environment, this study defines enacted capabilities as a firm's ability to mobilise and deploy IS-based resources in combination or co-present with other capabilities within SMEs (Bharadwaj, 2000; Grant, 1991). In other words, a set of resources becomes 'enacted capabilities' when they are combined or integrated in the performance of a task or activity (e.g., Barua et al., 2004). As enacted capabilities are complex and intangible, their essence is quantified with a multi-dimensional factor formed by top management IS skills and knowledge, support from external experts, trust in technology, trust in trading partners, and organisational culture. This study theorises that an increase in any one of these five dimensions in isolation will increase the total overall magnitude of the enacted capabilities construct without necessarily affecting the other dimensions.

The model depicted in Figure 1 presents the relationships among enacted capabilities, perceived net benefits, and attitude on extent of enablement. The research model

Figure 1. Generic Research Models of Innovative Information System Adoption Behaviours
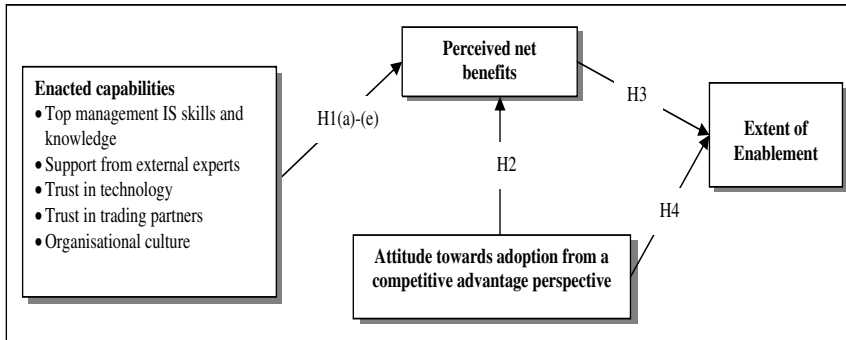
is developed from the extension of technology acceptance model (TAM) (e.g., Davis, 1989) and the resource-based view of the firm (e.g., Peppard and Ward, 2004; Bharadwaj, 2000; Barney, 1991). This study theorises that the enacted capabilities the SME possesses at the enablement stage affects the perceived net benefits at this stage. Moreover, enacted capabilities are hypothesised to influence extent of enablement indirectly through perceived net benefits. Attitude has an affective component (Triandis, 1975), and may occur either before or after cognitive processing (Berkowitz, 1993). SMEs with a more positive attitude at the time of adoption are likely to be more satisfied with the new system and to perceive the net benefits at the enablement stage (Guimaraes and Igbaria, 1997). This study also theorises a SME carries the attitude formed at the initial adoption decision stage to the enablement stage. This attitude is proposed to have a direct influence on perceived net benefits. Moreover, following TAM, this study theorises that attitude has a direct influence on the extent of enablement. The

development of individual hypothesis is discussed.

Top Management Information Systems Skills and Knowledge and Perceived Net Benefits

Top management with higher levels of IS skills and knowledge have a better understanding of the net perceived benefits of IS and in most instances, are more comfortable in adopting and utilising IS (e.g., Chang et al., 2003; Thong, 2001). Furthermore, they contribute more effectively to the IS implementation and utilisation (e.g., Thong, 2001; Kendall et al., 2001). A lack of or lower level of IS skills and knowledge possessed by top management creates insufficient awareness of the potential benefits and costs. Thus,

H1(a): The level of top management information systems skills and knowledge has a positive effect on the level of perceived net benefits of innovative IS.

Support from External Experts and Perceived Net Benefits

Prior studies on IS adoption within SMEs found external IS

expertise to be a significant factor (e.g., Thong, 2001). External experts act as mediators compensating for the lack of internal IS skills and knowledge. They also play a critical role in lowering and evaluating the knowledge barriers toward IS diffusion in SMEs (Caldeira and Ward, 2003; Thong et al., 1996). When the level of support from external experts is high/low, the level of perceived net benefits towards the adoption of the innovative IS by SMEs are also likely to be high/low (e.g., Lee, 2004; Kendall et al., 2001). Thus,

H1(b): The level of support from external experts has a positive effect on the level of perceived net benefits of innovative IS.

Trust in Technology and Perceived Net Benefits

Research into trust in technology reveals that businesses rely on technical safeguards, protection measures, and control mechanisms to avoid opportunistic behaviour (e.g., Bahmanziari et al., 2003; Chan and Lee, 2002). These mechanisms provide technological, organisational, and relationship benefits by ensuring timely, accurate, and complete transmission and receipt of transactions, thereby achieving transaction integrity, authenticity, confidentiality, non-repudiation, and availability (e.g., Ratnasingham, 2003; Jamieson, 1996). Lower trust in the technology, such as insecurity regarding the security-based mechanisms will escalate the perceived risks of innovative IS adoption, which in turn, will decrease the perceived net benefits. Thus,

H1(c): The level of trust in technology has a positive effect on the level of perceived net benefits of innovative IS.

Trust in Trading Partners and Perceived Net Benefits

Prior studies that examine trust in business relationships have identified trust to be a key factor for successful long-term trading partner relationships (e.g., McKnight et al., 2002). Prior studies also reveal that a lack of trust in trading partners during electronic procurement activities can lead to uncertainties such as unknown future events and their trading partners' responses to such events (e.g., Chan and Lee, 2002; Deeter-Schmelz et al., 2001). Perceived benefits such as satisfaction and information sharing are achieved from trust in trading partners (Bahmanziari et al., 2003; Ratnasingham, 2003). Without trust even low-value transactions would not take place, as the perception will be that the transactions are more vulnerable due to the firms' unfamiliarity with trading partners. Thus,

H1(d): The level of trust in trading partners has a positive effect on the level of perceived net benefits of innovative IS.

Organisational Culture and Perceived Net Benefits

SMEs cultural orientation can be conceptualised in terms of their strategic posture, i.e., as the competitive orientation of a firm (Covin and Slevin, 1991). These perceptual stances can range from the highly positive entrepreneurial stance to one of conservatism and resistance

to change. Organisational culture and IS adoption and utilisation are inter-related. Shan (1990) has argued that rapid emergence of new technologies demands the SMEs to be more innovative. In turn, this leads to the firm's greater willingness to seek out and accept new technologies to be more competitive. Placing Shan (1990) argument within the context of Covin and Slevin's (1991) conceptualisation of an entrepreneurial firm as one that seeks out innovation and is willing to accept change and the risk it brings, the entrepreneurial SMEs will most likely be able to deal with uncertainty, and thus, would perceive high benefits in adopting and utilising innovative IS. Thus,

H1(e): A more entrepreneurial organisational culture has a positive effect on the level of perceived net benefits of innovative IS.

Attitude and Perceived Net Benefits

TAM posits that cognitive beliefs predict attitude, i.e., attitude that occurs only after considerable cognitive operation have been accomplished (Davis, 1989). However, attitude has an affective component (Triandis, 1975), and may occur either before or after cognitive processing (Berkowitz, 1993). This paradigm on attitude-cognitive relationships argues that attitude and cognitive beliefs are "Separate and Partially Independent Systems" (Zajonc, 1984), and that attitude could precede cognitive process in a behavioural chain. For example, users with an initial positive attitude at the time of adoption are more likely to be satisfied with systems as they proceed to go through

the enablement stage and see the increased benefits associated with the system. Thus,

H2: The level of attitude towards adoption from a competitive advantage perspective at the adoption stage has a positive effect on the level of perceived net benefits at the enablement stage.

Perceived Net Benefits and Adoption Behaviour

There is much evidence that the adoption of IS is largely driven by perceived net benefits (e.g., Lee, 2004; Bhattacherjee and Premkumar, 2001). In turn, the perceived net benefits have direct impact on extent of enablement of innovative IS (Chan and Lee, 2002; Igbaria et al., 1997). If the perceived net benefits are positive, a firm is more likely to favour the innovative IS, and thus, become enabled and ultimately utilise the innovative IS. Even though quantifying such net benefits (specifically, indirect benefits), is generally difficult there is a perception of the proposed magnitude. Thus,

H3: The level of perceived net benefits at the enablement stage has a positive effect on extent of enablement.

Attitude and Adoption Behaviour

Rogers (1995) and Zmud (1984) assert the importance of relationship between organisation's attitude towards an innovative IS and its successful adoption. Attitude is central to behavioural theory, and many prior studies consider attitude to be a significant predictor of adoption behaviour (e.g., Ajzen and Fishbein, 1980). Moreover, prior studies have found that a positive

attitude has a positive impact on the adoption and utilisation decision. Furthermore, users' attitudes have a direct impact on IS success (Igbaria et al., 1997), and can be a major determinant of IS-enabled (e.g., Chau and Jim, 2002; Karahanna et al., 1999). Thus,

H4: The level of attitude towards adoption from a competitive advantage perspective at the adoption stage has a positive effect on extent of enablement.

Research Method

Background

A cross-sectional field study (i.e., survey) was conducted with CEOs/owners of Malaysia SMEs from December 2004 to January 2005. The innovative IS examined is the government's electronic procurement systems, better known as *ePerolehan*. Launched in December 2002, *ePerolehan* allows suppliers to present their products via electronic catalogues on the World Wide Web; to receive, manage and process purchase orders; to submit quotations, obtain tender documents and submit tender bids; and to receive payment from government agencies via the Internet. At the time of the study, out of 61,000 SMEs that registered for the *ePerolehan* system, about 7,736 SMEs are *ePerolehan* enabled (Commerce Dot Com Database, 2005).

Measures

Whenever possible, multi-items within each construct were developed and adapted from existing scales previously validated within IS literature. All items were measured using seven-point Likert scales representing a range from one strongly disagree to seven strongly agree.

This study adapts Yen et al.'s (2003) classification of IS core skills and knowledge associated with hardware, packaged products, operating systems, and implementation, operation, and maintenance issues to operationalise the construct "Top management IS skills and knowledge". The final six items developed represent the perceptions of top management and/or owner Respondents (e.g., Chau and Jim, 2002; Thong, 2001). "Support from external experts" construct was operationalised from measure developed and validated by Thong et al. (1996) and Yap et al. (1992). The measure consists of six items that include adequacy of technical support during and after implementation, quality of technical support, adequacy and quality of training provided, and relationship between external experts and other parties in the business.

"Trust in Technology" construct comes from sociology, and it deals with the structures (e.g., legal protections) that make an environment feels trustworthy (Pavlou, 2002). It consists of six items that measure the extent to which SMEs have confidence in the use of encryption and authorisation mechanisms (e.g. User ID and passwords) in relation to data and transaction integrity, authentication, confidentiality and non-repudiation. The construct "Trust in Trading Partners" was operationalised based on the responds' perceived confidence in the competency, reliability, skilfulness, reputation, and goodwill of the electronic procurement activities (Pavlou, 2002; McKnight

et al., 2002). Six items were used to measure and to capture the aspects of trust in trading partners that are most relevant to the government electronic procurement systems context.

The "organisational culture" construct was operationalised using ten items that are adapted and modified from Wallach (1983). However, instead of ranking these items, Respondents had to choose which statements best describe their organisation culture (Kanungo, et al., 2001). This study uses adjectives to describe the type of organisational culture. Within this study, the "attitude" construct is affective in nature, and is related to the set of their beliefs about adoption of innovative IS from a competitive advantage perspective at the time of adoption. Thus, rather than measuring attitude using a multi-item semantic differential scale, this study adapts Chau and Hu (2002) measurement scale using a seven-point Likert-type scale, with 1 'strongly disagree' at one end to 7 'strongly agree' at the other end. The final six items were developed to assess whether being able to use the ePerolehan to conduct procurement online was a "wise" or "foolish" towards certain consequences, such as SMEs remaining competitive and/or successful.

This study takes a similar approach to prior studies by exploring the measures of "perceived net benefits" via the expected success and/or advantages arising from adopting and enabling electronic procurement systems (Mehrtens et al., 2001; Iacovou et al., 1995). It is the owner-manager's perceptions of the efficiency, effectiveness, and management control of adopting and utilising the electronic procurement system that were assessed (Chau and Jim, 2002; Thong et al., 1996). The final twelve items were developed to assess perceived net benefits that include: efficiency benefits from the relative advantage of the electronic procurement system over traditional procurement; effective way for employees to gather information (about their trading partners, products, orders, payment); as a business tool to build the firm's image, and to promote the firm nationally and internationally.

The innovative IS investigated in this study, the electronic procurement systems (i.e., *ePerolehan*) is mandatory. Those SMEs that have registered for the electronic procurement systems are already considered as adopters of the system. Hence, the dichotomous measure used in prior studies is inappropriate because the adoption behaviour measure in this study is not the decision whether to adopt or not adopt innovative IS. Rather, four abilities of tasks related to electronic procurement systems (such as, receiving and processing orders, sending invoices, receiving payments, and providing product catalogues to their buyers) are identified and are used as measures of the "extent of enablement" construct (Davila et al., 2003).

Validation of Research Instrument

The instrument was pre-validated by panel of academics. The instrument was then put through a two way language translation process to ensure that the translation to Malay was valid (language in which survey was ultimately administered). The instrument was also validated for ease of answerability by ten Malaysia

SMEs and pilot tested using thirty five SMEs randomly selected from the population of government suppliers.

Data Collection, Samples and Non-Response Bias

The questionnaire was mailed to 1,000 SMEs registered for ePerolehan. The final number of usable responses was 206, i.e., a response rate of 21.5 percent. Sixty-five percent of the SMEs have been in business for more than six years. Forty-eight percent of the respondents were in the servicing industry, with ten percent in manufacturing, and forty-two percent in trading and construction. In addition, fifty percent of respondents have been involved with the Perolehan for more than one year. The distribution of the respondents' demographic information was a reflection of the actual profile of SMEs in Malaysia (Malaysian Economic Report, 2004). Tests were conducted to ensure that there was no late response bias and also limited non-response bias. Follow up semi-structured interviews were conducted with twenty-one CEOs/ owners of SMEs.

Scale Reliability and Validation

Principal component analysis was performed. All constructs appeared to be reliable and valid except the organisational culture construct. Hence, individual item reliability for all constructs was further assessed by examining the simple correlations of the measures with their respective constructs using SPSS program. All items of the constructs except three items in the organisational

culture were above the 0.50 cut-off values recommended. The low reliabilities could exist because the items linked to the construct are not uni-dimensional (Barclay et al., 1995). Furthermore, the results of the principal component analysis as shown in Table 1 revealed two factors of organisation culture with items "highly structured and systematic (orgcul1)" adn "procedural and regulated (orgcul3)" loaded onto one factor, whereas "creative and innovative (orgcul2)" loaded onto two factors each with very low loadings (referred to Table 1).

Following the recommendation by Churchill (1979), the quality of the two factors was assessed via the adequacy of reliability indices (e.g., Thong, 2001; Nunnally, 1978). The Cronbach alpha for the dimension of organisational culture, (1) "highly structured and systematic (orgcul1)", (2) "regulated and procedural (orgcul3)", and (3) "creative and innovative (orgcul2)" is 0.52, and each of these items has low item reliabilities ranging from 0.21 to 0.44. Thus, although these three items may form a dimension, their internal consistency and reliability are very low (i.e., below recommended threshold of 0.50 as suggested by Nunnally (1978)). When the item "creative and innovative (orgcul2)" is included with the remaining seven items the Cronbach alpha is 0.89, however, the "creative and innovative (orgcul2)" item has very low individual item reliability of 0.32. Since the three items add very little explanatory power to the model, they were dropped from further analysis (Hulland, 1999; Nunnally, 1978). Thus, for the purpose of this study organisational culture form a

Table 1. Principal Component Analysis – Organisational Culture (Adoption Stage)

| Component | Total Variance Explained | | | | | | Rotated Component Matrix | | |
| | Initial Eigenvalues | | | Rotation Sums of Squared Loadings | | | | Component | |
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		1	2
1	4.66	46.59	46.59	4.61	46.08	46.08	highly structured & systematic (orgcul1)		0.81
2	1.58	15.82	62.40	1.63	16.32	62.40	creative & innovative (orgcul2)	0.34	0.47
3	1.02	10.20	72.61				procedural & regulated (orgcul3)		0.81
4	0.77	7.74	80.35				risk-taking (orgcul4)	0.60	
5	0.51	5.13	85.48				result-oriented (orgcul5)	0.76	
6	0.39	3.93	89.42				stimulating & challenging (orgcul6)	0.79	
7	0.37	3.75	93.16				enterprising & driving (orgcul7)	0.86	
8	0.29	2.90	96.06				supportive & trusting (orgcul8)	0.81	
9	0.24	2.43	98.49				relationships-oriented & collaborative (orgcul9)	0.90	
10	0.15	1.51	100.00				safe & encouraging (orgcul10)	0.85	

uni-dimensional construct.

After the omission of the three items in the organisational culture, all constructs were analysed using PLS analysis for adequate internal consistency reliabilities. The value is above the recommended value of 0.70 (Agarwal and Karahanna, 2000; Barclay et al., 1995), thus suggesting adequate internal consistency reliabilities of the measurement model.

Comparison of Construct Means Enabled Non-Active Adopters and Enabled Active Adopters

To understand why some SMEs are able to adopt and the extent of its enablement while others fail to do so, this study drilled down the dataset using two dimensions. At the enablement stage, the registered SMEs go through a process of becoming enabled for use and thus can conduct their procurement

electronically. Some enabled SMEs, however, may have never used and/ or seldom use the system, such that they become 'enabled non-active adopters'. Other enabled SMEs are currently actively using the system (i.e. sometimes, half of the time, often, very often and all the time), and thus, they become 'enabled active adopters'.

In general, there are significant statistical differences between enabled non-active adopters and enabled active adopters in terms of attitude towards adoption from a competitive perspective ($F_{(1, 173)}$ = 66.1, p = 0.000, Partial Eta Squared = 0.276). The mean scores in Table 2 indicate that enabled active adopters possessed a higher attitude towards adoption from a competitive advantage perspective than enabled non-active adopters. However, there no statistical differences between the two groups in term of perceived net benefits ($F_{(1, 173)}$ = 34.9, p = 0.000, Partial Eta Squared = 0.168).

There are significant differences between these two groups in terms of their level of enacted capabilities

Table 2. Comparisons of Constructs Means
(Enabled Non-active Adopters and Enabled Active Adopters)

| Constructs | Enabled Adopters | | | | | |
| | Active Adopters | | Non active adopters | | | |
	Mean	Std. Dev	Mean	Std. Dev	Mean Difference	Sig.
Attitude	6.05	0.63	5.35	0.49	0.70	0.00**
Perceived net benefits	4.76	0.74	4.72	0.79	0.4	0.73
Top management IS skills and knowledge	4.96	0.81	4.79	0.79	0.17	0.19
Support from external experts	4.56	1.12	4.21	0.86	0.34	0.03**
Trust in technology	4.97	0.76	4.56	0.78	0.40	0.00**
Trust in trading partner	4.75	1.01	4.65	0.86	0.11	0.47
Organisational culture	4.90	0.47	4.99	0.53	0.94	0.31

**The mean difference is significant at p < 0.01 level. Adjustment for multiple comparisons: Bonferroni.

*The mean difference is significant at p < = 0.10 level. Adjustment for multiple comparisons: Bonferroni.

$(F_{(17, 157)} = 7.251., p = 0.000;$ Wilks' Lambda $(\beta) = 0.560$; Partial Eta Squared $= 0.440$). When the enacted capabilities were considered separately, support from external experts $(F_{(1, 173)} = 5.020, p = 0.030,$ Partial Eta Squared $= 0.030$), and trust in technology $(F_{(1, 173)} = 5.385, p = 0.010,$ Partial Eta Squared $= 0.060$) were significantly different. The mean scores in Table 2 indicate enabled active adopters reported higher levels of support from external experts and trust in technology than enabled non-active adopters.

In brief, the findings inform as to the relevancy and importance of enacted capabilities if SMEs are to deploy and mobilise successful electronic procurement systems strategies. The above findings are consistent with the notion that all SMEs have enacted capabilities, and those SMEs with strong enacted capabilities, attitude, and perceived net benefits can both leverage IS enabled change for business advantage and respond rapidly to changes in the IS business environment.

Data Analysis

Structural Equation Modelling - Partial Least Square Approach

Structural Equation Modelling (SEM) is the technique for data analysis used in this study. SEM has the ability to statistically test prior theoretical assumptions against empirical data (i.e., confirmatory factor analysis) and thus answers a set of interrelated research questions simultaneously through both measurement and structural models. The estimation of the structural model is performed using component-based analysis, known as Partial Least Squares (PLS). PLS is appropriate as it predicts causal relationships among the latent constructs (i.e. enacted capabilities, attitudes, perceived net benefits, with extent of enablement) (Chin, 1998; Fornell et. al., 1996). Additionally, the PLS approach does not place as much demand on measurement scales and sample size (Hulland, 1999; Chin, 1998) nor presume any multivariate normality distribution (Bhattacherjee and Premkumar, 2004; Hulland, 1999). Given the small sample size of 206 PLS is deemed most appropriate.

Results

Enabled Non-active Adopters

As shown in Figure 2, only hypothesised path from top management IS skills and knowledge to perceived net benefits were significant $(\beta = 0.403, p < 0.01)$, with 25.9 percent of the variance in perceived net benefits is explained. Thus, hypothesis H1(a) is supported, and hypotheses H1(b), H1(c), H1(d) and H1(e) are not supported. The hypothesised path from attitude to perceived net benefits was not significant $(\beta = 0.113, p > 0.10)$. Thus, hypothesis H2 is not supported. The hypothesised path from perceived net benefits to extent of enablement was not significant $(\beta = 0.116, p > 0.10)$. Thus, hypothesis H3 is not supported. The hypothesised path of attitude to extent of enablement was significant $(\beta = 0.227, p < 0.01)$, 7.3 percent of the variance in extent of enablement is explained. Hence, hypothesis H4 is supported.

PLS analysis was again performed on the research model

to obtain the refined model, i.e., the most plausible statistical model for the phenomenon under investigation. The refined model in Figure 3 indicates top management IS skills and knowledge is still significant (ß = 0.468, p < 0.001). This factor explained 21.9 percent of the variance in perceived net benefits. The hypothesised path from attitude to extent of enablement is also still significant (ß = 0.218, p < 0.05). Two new paths from specific enacted capabilities to extent of enablement emerged as significant. They were support from external experts (ß = 0.269, p < 0.001) and trust in technology (ß = 0.218, p <

0.001). Taken together, these enacted capabilities and attitude explained 20.3 percent of the variance in extent of enablement.

Enabled Active Adopters

As shown in Figure 4, the hypothesised paths from top management IS skills and knowledge (ß = 0.213, p < 0.05), trust in technology (ß = 0.169, p < 0.10), and trust in trading partners (ß = 0.440, p < 0.001) to perceived net benefits were significant. All these enacted capabilities explained 58.5 percent of the variance in perceived net benefits. Thus, hypotheses H1(a), H1(c) and H1(d) are supported. The

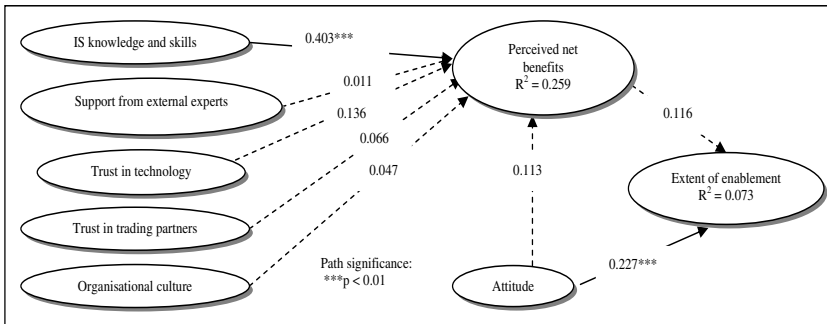Figure 2. PLS Analysis of Proposed Structural Model-Enabled Non-active Adopters

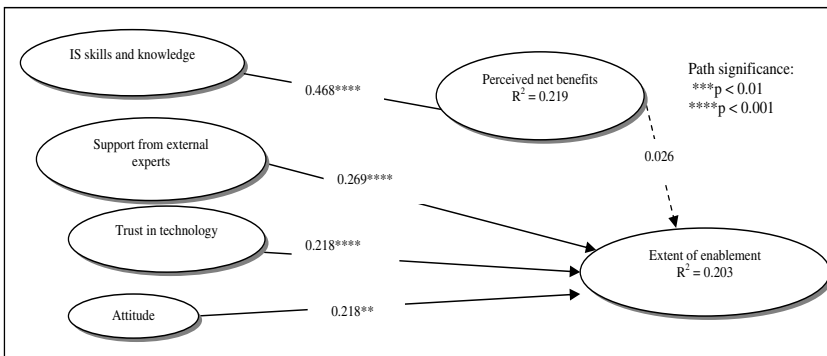Figure 3. PLS Analysis of Refined Structural Model-Enabled Non-active Adopters.

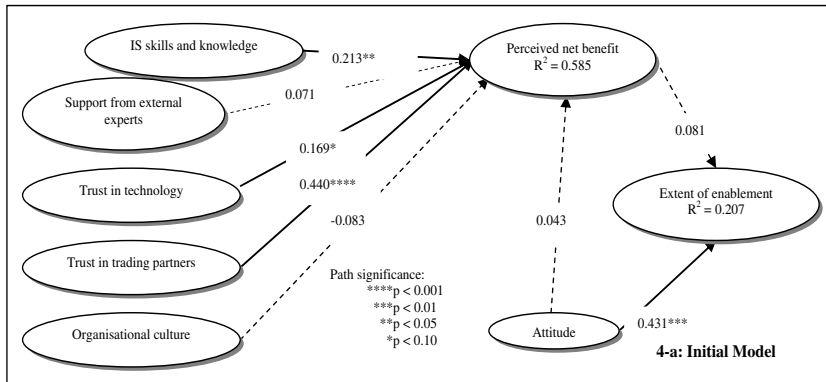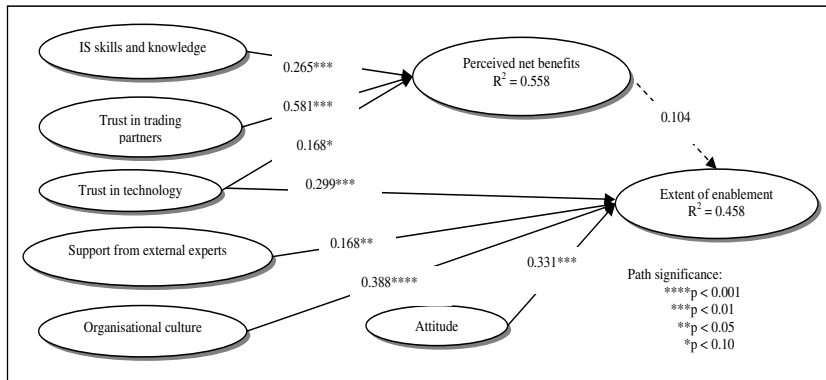Figure 4. PLS Analysis of Proposed Structural Model-Enabled
Active Adopters.

Figure 5. PLS Analysis of Refined Structural Model -
Enabled Active Adopters

hypothesised paths from support from external experts (β = 0.071, p > 0.10) and organisational culture (β = -0.083, p > 0.10) to perceived net benefits were not significant. Thus, hypotheses H1(b) and H1(e) are not supported. The hypothesised path from attitude to perceived net benefits was not significant (β = 0.043, p > 0.10). Thus, hypothesis H2 is not supported. The hypothesised path from perceived net benefits to extent of enablement was not significant (β = 0.081, p > 0.10). Thus, hypothesis H3 is supported. The hypothesised path from attitude to extent of enablement was significant (β = 0.431, p > 0.01). Thus, hypothesis

H4 is supported.

The refined model in Figure 5 indicates that top management IS skills and knowledge (β = 0.265, p < 0.01), trust in technology (β = 0.168, p < 0.10) & trust in trading partners (β = 0.581, p < 0.01) are still significant. These factors jointly explained 55.8 percent of the variance in perceived net benefits. The hypothesised path, attitude (β = 0.331, p < 0.01) to extent of enablement also remains significant. Three new paths, support from external experts (β = 0.168, p < 0.05), trust in technology (β = 0.299, p < 0.01), and organisational culture (β = 0.388, p < 0.001) to extent of enablement emerged as significant.

Taken together these enacted capabilities with attitude explained 45.8 percent of the variance in extent of enablement.

Discussion

The models for both enabled non-active adopters and enabled active adopters revealed numerous similarities, but also highlighted some differences. Attitude was found to significantly affect extent of enablement for both adopters. There was a significant association between enacted capabilities and perceived net benefits. Examination of the separate models for enabled non-active adopters revealed only statistical support for the effect of top management IS skills and knowledge on perceived net benefits. Whereas for enabled active adopters, apart from top management IS skills and knowledge, trust in technology and trust in trading partners also affected perceived net benefits.

The results demonstrate support on the importance of top management IS skills and knowledge on perceived net benefits. The findings suggest SMEs with more knowledge and more skilful with the innovative IS are more likely to perceive the potential benefits the system has to offer. In addition, having trust in technology and trust that SMEs develop with their trading partners to facilitate one's job and advance the business environment is also relevant in the evaluation of perceived net benefits. These expectations of the net benefits then allow SMEs to be comfortable and confident. This aspect ultimately leads to the positive adoption behaviour.

On the contrary, support from external experts was not a contributing factor to perceived net benefits for both enabled active adopters and enabled non-active adopters. Although Attewell (1992) emphasises the importance of these experts as mediators that compensate for the lack of skills and knowledge, and thus play a critical role in lowering and evaluating the knowledge barriers toward IS diffusion, they become less significant at the enablement stage.

In the refined model, support from external experts and trust in technology emerged as significant factors in affecting extent of enablement for both enabled non-active adopters and enabled active adopters. The finding demonstrates that qualified external support is very important in assisting these adopters to prepare themselves for enablement activities. Concerning the effect of trust in technology, once SMEs trust the technology, the full potential of IT/IS capabilities increase their comfort level and ultimately increases the extent of their enablement ability and utilisation of the system. The results suggest the importance of these factors in influencing extent of enablement. directly, rather than indirectly via perceived net benefits.

Organisational culture was also the factor underlying extent of enablement for enabled active adopters. The findings demonstrate that the cultural orientation does play a crucial role in affecting the adoption behaviour in future. This finding supports (Boynton et al., 1994) recommendation emphasising the importance of organisation

culture in determining innovative IS adoption behaviour.

Implications and Future Research

Using well-accepted theoretical foundations and results of prior studies, this study extends the theory of innovative adoption behaviours by specifying a new construct, i.e., enacted capabilities, and their subsequent effects on adoption behaviour by SMEs in developing countries. Thus, this study represents a unique contribution in the area of IS adoption behaviour research within SMEs in several ways. *First*, the model increases our understanding of the adoption behaviour of SMEs in technologically developing countries. This is particularly significant as little research have been conducted in the region. The results demonstrate the importance of particular enacted capabilities in relation to the adoption behaviour by SMEs in developing countries. The model could be applied to firms within developed countries to determine the difference between developing and developed countries, with respect to the adoption process of innovative IS.

Second, enacted capabilities display important roles as antecedents to perceived net benefits. Thus, apart from requiring good ideas and financial resources, SMEs also require enacted capabilities that lead to efficient and effective adoption. This study demonstrates that the decisions made by SMEs are intertwined with organisational capabilities and individual perceptions and attitudes.

This study also has significant practical implications for innovative IS adoption and utilisation among SMEs. The positive attitude SMEs form at the adoption stage and maintain through the diffusion of innovation will influence them to be more receptive towards enabling and utilising innovative IS. From an adopter retention perspective, the regulators and systems developer of innovative IS need to devote resources to creating a positive users experience (e.g., by investing in user training programs and increasing the level of trust and confidence in the technology and trading partners). For instance, in the case of electronic procurement systems, the observed effect of attitude on extent of enablement suggests that attention should be given to enabled non-active adopters to actively cultivate and solidify their enacted capabilities and favourable attitude at the time of adoption.

Several future research directions follow from this research. To improve the generalisability of results, the first research suggestion is that replication is desirable. The differing effects of enabled non-active adopters versus enabled active adopters enacted capabilities may suggest that enacted capabilities may be influenced by different organisational learning and practices. There exist a number of approaches to organisational learning and practices. Further research, capitalising on different approaches of organisational learning could investigate effects organisational learning has on enacted capabilities for different types of adopters. Finally, the conceptualisation of

extent of enablement and usage within firms could be examined more fully. Rather than a simple scale of SMEs perceptions of the ability to use the systems and frequency of use, other forms of usage such as integrative use and emergent use (Saga and Zmud, 1994) and diversity and intensity use (Thompson et al., 1991) may be investigated. The use of these extended dimensions of use may provide a deeper understanding of the innovative IS adoption behaviour by SMEs.

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About the Author

Noor Akma Mohd Salleh (*akmasalleh@um.edu.my*) is a lecturer within the Faculty of Business and Accountancy, The University of Malaya. She earned her Ph.D. from the University of Queensland, Brisbane, Australia. Her primary research activities involve the area of adoption behaviour of innovative information systems (e.g., accounting and business information systems) by organisations and also the area of information management and it effect on organisations. Noor Akma has researched, presented, and published on the adoption and utilisation behaviour and the effect of innovative information systems adoption.