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PREDICTING SMES WILLINGNESS TO ADOPT ERP, CRM, SCM & E-PROCUREMENT SYSTEMS

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Abstract

The attention of software vendors has moved recently to Small to Medium-sized Enterprises (SMEs) offering them a vast range of Enterprise Systems (ES) including ERP, CRM, SCM and E-Procurement systems, which were formerly adopted by large firms only. From reviewing the literature on the adoption and diffusion of Information Systems' (IS) innovations, the question of 'why some SMEs choose to adopt ES while seemingly similar others facing the same market conditions do not' is still under-studied. This paper intends to fill this gap by developing a model that can be used to predict which SMEs are more likely to become adopters of ES. Using direct interviews, data was collected from 102 SMEs located in the Northwest of England. Logistic regression was used to analyse the data. Results reveal that factors influencing SMEs' adoption of ES are different from factors influencing SMEs' adoption of other previously studied IS innovations. SMEs were found to be more influenced by technological and organisational factors than environmental factors. Moreover, results indicate that firms with a greater perceived relative advantage, a greater ability to experiment with ES before adoption, a greater top management support, a greater organisational readiness and a larger size are predicted to become adopters of ES.

Keywords: SMEs, IS, IT, Innovations, Enterprise Systems, ERP, CRM, SCM, E-procurement, Adoption, Diffusion

1 INTRODUCTION

SMEs are considered as major economic players and a potent source of national, regional and local economic growth (Taylor and Murphy 2004). Most small firms still under-utilise the potential value of IS innovations by only restricting them to administrative tasks (Brock 2000). Enterprise systems (ES) provide Small to Medium-sized Enterprises (SMEs) with opportunities that are largely unexploited. ES are defined as: “*commercial software packages that enable the integration of transaction-oriented data and business processes throughout an organization (and perhaps eventually throughout the entire interorganizational supply chain)*” (Markus and Tanis 2000, pp. 176). In our definition, ES include ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), SCM (Supply Chain Management), and E-procurement systems (Shang and Seddon 2002). Without a better understanding of the complex processes and the differentiating factors that affect IS innovations’ adoption level, the drive to adopt and develop IS innovations will not successfully contribute to SMEs’ competitiveness (Martin and Matlay 2001).

The ‘SMB Global Model’ study (AMI-Partners 2004) predicts that SMEs’ spending worldwide on IT and telecommunications will exceed US\$ 1.1 trillion during 2008. Furthermore, it is predicted that the global level of SMEs’ spending on CRM software packages alone will double to reach US\$ 2 billion by 2008 (Datamonitor 2004). As a result, the attention of software vendors has moved to SMEs’ market offering them a vast range of ES (Ramdani and Kawalek 2007a). The question of ‘why some SMEs choose to adopt ES while seemingly similar others facing the same market conditions do not’ is still under-studied. This study intends to fill this gap by developing a model that can be used to predict which SMEs are more likely to become adopters of ES.

2 RESEARCH MODEL

Many theoretical models have been used to examine SMEs’ adoption of IS innovations: Technology Acceptance Model (TAM) (e.g. Grandon and Pearson 2004); Theory of Planned Behaviour (TPB) (e.g. Harrison et al. 1997); Combined TAM and TPB (e.g. Riemenschneider et al. 2003); TAM2 (e.g. Venkatesh 2000); Innovation Diffusion Theory (e.g. Premkumar 2003); Resource-Based View (e.g. Mehrrens et al. 2001); Stage Theory (e.g. Poon and Swatman 1999); and Unified Theory of Acceptance and Use of Technology (UTAUT) (e.g. Anderson and Schwager 2003). From reviewing these models (Ramdani and Kawalek 2007b), IS innovations’ adoption/diffusion research typically evaluate various technological, organisational, and environmental factors that facilitate or inhibit adoption/diffusion. Technology-Organisation-Environment (TOE) framework developed by Tornatzky and Fleischer (1990) has been tested and validated by many studies (e.g. Kuan and Chau 2001, Premkumar and Roberts 1999, Iacovou et al. 1995). TOE framework has also been claimed to be a generic theory of technology adoption/diffusion (Zhu et al. 2003) that can be used to study SMEs’ willingness to adopt ES as illustrated in Figure 1 (Ramdani and Kawalek 2007a). This study will use this framework to develop a statistical model that can be used to predict which SMEs are more likely to become adopters of ES.

2.1 Technological Context

Premkumar (2003) argues that there are very few studies that have examined the impact technological characteristics in the context of small business. Rogers’ (2003) innovation diffusion theory for organisations will be used as a theoretical basis for studying the impact of technological factors on SMEs’ willingness to adopt ES.

Relative Advantage is defined as “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers 2003, pp. 229). Studies found this variable to be positively related to the adoption of IS innovations (e.g. Grandon and Pearson 2004, Kuan and Chau 2001). When an IS innovation is perceived to offer relative advantage over the firm’s current practice, it is more likely to be adopted (Lee et al. 2004). This view has support in the general innovation/diffusion research (e.g. Moore and Benbasat 1991, Tornatzky and Fleischer 1990), and more specifically in the context of small business (e.g. Thong 1999, Cragg and King 1993). ES provide many benefits to adopters in terms of accommodating business growth, improving business processes and reducing business operating and administrative costs (Markus and Tanis 2000). In a highly competitive marketplace, these benefits make significant motivations for adopting these technologies.

Hypothesis 1. The greater the perceived relative advantage of ES, the more likely SMEs will be willing to adopt these systems.

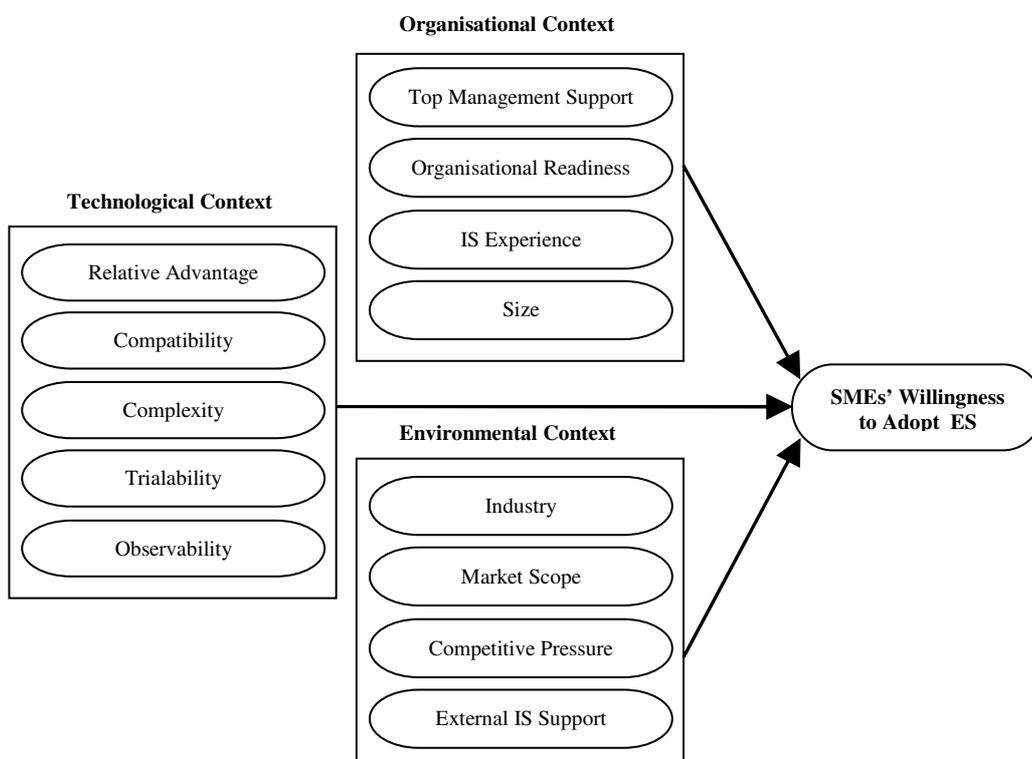


Figure 1. TOE framework of SMEs’ willingness to adopt enterprise systems

Compatibility of an innovation with a business is defined as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Rogers 2003, pp. 240). Premkumar (2003) found compatibility to be an important determinant of IS innovations’ adoption. The adoption of new technologies can bring significant changes to the work practices of businesses and resistance to change is a normal organisational reaction (Premkumar and Roberts 1999). Therefore, it is important, especially for small businesses, that the changes are compatible with its infrastructure, values and beliefs.

Hypothesis 2. The greater the perceived compatibility of ES with current infrastructure, values and beliefs, the more likely SMEs will be willing to adopt these systems.

Complexity is defined as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers 2003, pp. 257). The complexity of the technology creates greater uncertainty for successful implementation and therefore increases the risk in the adoption decision

(Premkumar and Roberts 1999). This factor has been found to be negatively associated with adoption of IS innovations (e.g. Grover and Goslar 1993, Cooper and Zmud 1990). It has also been found to be an important determinant of IS innovations' adoption in the context of small business (e.g. Lertwongsatien and Wongpinunwatana 2003, Thong 1999).

Hypothesis 3. The lower the perceived complexity of ES, the more likely SMEs will be willing to adopt these systems.

Trailability is defined as “the degree to which an innovation may be experimented with on limited basis” (Rogers 2003, pp. 258). In the context of small business, Kendall et al. (2001) found trailability to be positively related to e-commerce adoption. The IS innovations under examination in this study are currently new to the SME market. Hence, trailability is expected to be exceptionally relevant.

Hypothesis 4. SMEs with greater ability to experiment with ES before adoption are more likely to be willing adopt these systems.

Observability is defined as “the degree to which the results of an innovation are visible to others” (Rogers 2003, pp. 258). In the context of small business, observability is the only attribute out of the five technological characteristics that has not been found to be positively related to IS innovations' adoption. IS innovations that have been seen to make an impact in the industry in which an SME operates is more likely to be viewed in a favourable light.

Hypothesis 5. The greater the observability of ES, the more likely SMEs will be willing to adopt these systems.

2.2 Organisational Context

The characteristics in the organisational context seem to be the primary focus of many studies in the context of small business (Premkumar 2003). Top management support, organisational readiness, IS experience and size are considered to be factors that influence SMEs' willingness to adopt of ES.

Jeyaraj et al. (2006) found that *top management support* to be one of the best predictors of organisational adoption of IS innovations. Top management can stimulate change by communicating and reinforcing values through an articulated vision for the organisation (Thong 1999). Many studies have found top management support to be critical for creating a supportive climate for the adoption of new technologies (e.g. Premkumar and Roberts 1999, Grover and Goslar 1993). In SMEs, the decision-maker is very likely to be in the top management team and his/her support is vital for the adoption to take place.

Hypothesis 6. The greater the top management support for ES adoption, the more likely SMEs will be willing to adopt these systems.

Organisational readiness is defined as “the availability of the needed organisational resources for adoption” (Iacovou et al. 1995, pp. 467). Organisational readiness, as used in previous research on electronic data interchange (EDI) adoption, measures whether a firm has sufficient IS sophistication and financial resources (Iacovou et al. 1995, Swatman and Swatman 1992). Indeed, economic costs and lack of technical knowledge are identified as two of the most important factors that hinder IS growth in small organisations (Cragg and King 1993). IS sophistication assesses whether a firm is technologically ready to undertake the adoption of an IS innovation, while financial resources express an organisation's capital available for IS investment (Chwelos et al. 2001).

Hypothesis 7. The greater the financial and technological resources, the more likely SMEs will be willing to adopt ES.

Firms that do not have much *IS experience* may be unaware of new technologies or may not want to take a risk to adopt them. Dholakia & Kshetri (2002) suggest that technologies already existing in an

organisation influence the future adoption of a new technology. They argue that the incremental cost and knowledge required to adopt the Internet, for example, will be much smaller if a firm already owns a computer and a telephone. Moreover, other studies have found that prior IS experience influence the adoption of new technologies (e.g. Kuan and Chau 2001, Fink 1998).

Hypothesis 8. The greater the SMEs' experience with IS innovations, the more likely they will be willing to adopt ES.

Organisational *size* has been identified by Jeyaraj et al. (2006) as one of the best predictors of organisational adoption of IS innovations. Goode and Stevens (2000) study shows that business size, previously the best indicator of technology adoption, was not significantly related to IS innovations' adoption. However, the typical argument is that larger firms have a greater need, resources, skills and experience and the ability to survive failures than smaller firms (Levenburg et al. 2006, Yap 1990). It can be argued that larger firms are more likely to adopt ES.

Hypothesis 9. The larger the size of the SME, the more likely they will be willing to adopt ES.

2.3 Environmental Context

Industry, market scope, competitive pressure and external IS support are considered to be factors that influence SMEs' willingness to adopt ES.

It has been argued that the *industry* in which the firm operates influences the adoption of IS innovations (Levenburg et al. 2006, Raymond 2001). Service industries, which rely on the processing of information, depend on information systems (Goode and Stevens 2000). Retail industries, which rely on the transfer of goods, may have a greater dependence on point-of-sale systems (Premkumar and King 1994). Manufacturing industry rely more on ERP systems. Fallon and Moran (2000) showed that IS usage varies not only across sectors (i.e. across Standard Industrial Classification codes) but also within constituent sub-sectors.

Hypothesis 10. The industry sector influences SMEs' willingness to adopt ES.

Zhu et al. (2003) defines *market scope* as "the horizontal extent of a firm's operations" (pp. 254). They argue that the role of market scope as a predictor can be explained from two main perspectives. First, internal coordination costs increase as firms expand their market reach due to the increased administrative complexity and information processing (Gurbaxani and Whang 1991). Business digitisation is claimed to help reduce these costs (Shapiro and Varian 1999). Second, external costs (search costs and inventory holding costs) would also increase with market scope (Gurbaxani and Whang 1991). When firms expand their market reach, they incur search costs which include searching for consumers, trading partners, and distributors. They may also incur inventory holding costs as a result of not controlling demand uncertainty in different market segments (Chopra and Meindl 2001). SMEs adopting ES are expected to decrease external costs. Arguably, firms that serve broader markets are more likely to adopt ES.

Hypothesis 11. SMEs with a greater market scope are more likely to be willing to adopt ES.

Competitive pressure has been identified by Jeyaraj et al. (2006) as one of the best predictors of organisational adoption of IS innovations. Competition in the adopter's industry is generally perceived to positively influence the adoption of IS innovations (Gatignon and Robertson 1989). This is argued to be even more evident if the innovation directly affect the competition (Kuan and Chau 2001, Premkumar and Roberts 1999). Premkumar and Ramamurthy (1995) claim that it has become a strategic necessity to have these new technologies to compete in the market place.

Hypothesis 12. The greater the competitive pressure, the more likely SMEs will be willing to adopt ES.

External IS support refers to the availability of support for implementing and using IS innovations (Premkumar and Roberts 1999). External IS support has not only been found to be an important

determinant of IS success (e.g. Delone 1988, Raymond 1985), but also to be positively related to IS innovations' adoption (e.g. Premkumar and Roberts 1999, Fink 1998). With the popularity of outsourcing and the growth in third party support, firms are more willing to adopt new IS innovations if they feel there is adequate vendor or third party support (Premkumar and Roberts 1999).

Hypothesis 13. The greater the external IS support for ES, the more likely SMEs will be willing to adopt these systems.

3 MEASUREMENT

Measures are presented in Table 1. Most of the measures were obtained from previous research whose validity and reliability have been demonstrated.

Concept	Operational Measure	Sources
<u>Dependent Variable:</u> SME's willingness to adopt ES	Dummy variable 0= Unwillingness to adopt ES 1= Willingness to adopt ES	Thong and Yap (1995) Grover (1993)
<u>Independent Variables:</u> Size	Number of employees 1= 0-9 2= 10-49 3= 50-249	DTI (2004) EC (2003)
Industry	1= Manufacturing 2= Retail/Wholesale 3= Services	Goode and Stevens (2000)
Market Scope (MS)	1= Local 2= Regional 3= National 4= International	Buonanno et al. (2005)
IS Experience (ISE)	1= Low IS users 2= Medium IS users 3= High IS users	Southern and Tilley (2000)
Relative Advantage (RA) Compatibility (CM) Complexity (CX) Trialability (TR) Observability (OB)	Multi-items	Moore and Benbasat (1991)
Top Management Support (TMS)	Multi-items	Yap et al. (1994)
Organisational Readiness (OR)	Multi-items	Grandon and Pearson (2004)
Competitive Pressure (CP)	Multi-items	Premkumar and Roberts (1999)
External IS Support (EISS)	Multi-items	Yap et al. (1994)

Table 1. *Operationalisation of Key Variables*

4 DATA COLLECTION

Using FAME (Financial Analysis Made Easy) database, a random sample of 300 SMEs was chosen in the Northwest of England. Firms with fewer than 250 employees were considered to be SMEs (DTI 2004, EC 2003). This study used direct interviews to collect information from owner/manager or the IS manager in the company. The interviewer administered survey, although expensive and time consuming, was preferred because it allowed us to gain a fairly good response rate and reduce the level of non-responses. Because the questions about ES are of contemporary nature, this technique was useful because it enabled the interviewer to correct any ambiguities and unfold any issues raised by respondents. In conducting the interviews, letters were sent to all firms in our sample frame followed by calls to invite them to participate in the study. Firms with positive responses were asked to provide a date for the researcher to visit the company site and conduct the interview. The respondents were informed that their participation was voluntary and the information they provided was confidential. 110 SMEs participated in this study with interviews lasting for an average of one hour. Eight firms have already adopted ES. Forty three firms were out of business and could not be reached anymore. This study ended with 102 usable responses, which means response rate achieved in this study is about 40 percent. Compared to the response rate standard of 60 percent suggested by Curran & Blackburn (2001), this study's response rate is not high but falls inline and even better in some cases than previous studies (e.g. Grandon and Pearson 2004, Thong et al. 1996, Premkumar and Potter 1995).

5 VALIDITY AND RELIABILITY

The validity and reliability of the constructs are tested to ensure that the measurement was accurate. Validity refers to how accurately the construct reflects what it intends to measure, and reliability refers to the consistency of the results obtained. According to Ghauri et al. (2002), several criteria can be used to judge construct validity: face validity, convergent validity and divergent validity. Face validity was ensured by consulting experts in the field and pilot testing of the questionnaires with SMEs' owners/managers before carrying out the main study. This ensured correcting any ambiguities in measurements as well as capturing correctly the concepts used in this study. Moreover, construct validity is ensured by taking into account the usage principle (Babbie 2007). The operational measures used in this study were taken from previous work in the field that was published in reputable academic journals. Reliability of the construct was assessed using Cronbach α . The results indicate that all of the variables have values greater than the cut off value of 0.7 suggested by Nunnally (1978). Reliability was also ensured using face-to-face interviews where interviewer ensures that each respondent is answering the same questions.

6 RESULTS

Because the research model uses a dichotomous dependent variable and a mixture of continues and dichotomous independent variables, logit model has been used to empirically validate the research model. Similar models have been developed in the literature to study the adoption of IS innovations: communication technologies (Premkumar 2003); electronic business (Zhu et al. 2003); EDI (Kuan and Chau 2001); and open system (Chau and Tam 1997). Based on the TOE framework of SMEs' willingness to adopt ES, the logit model is specified as follows:

$$\ln (P_i / 1-P_i) = \beta_0 + \beta_1. RA_i + \beta_2. CM_i + \beta_3. CX_i + \beta_4. TR_i + \beta_5. OB_i + \beta_6. TMS_i + \beta_7. OR_i + \beta_8. ISE_i + \beta_9. Size_i + \beta_{10}. Industry_i + \beta_{11}. MS_i + \beta_{12}. CP_i + \beta_{13}. EISS_i + \varepsilon_i$$

Logit analysis is a preferred technique because it does not assume equal variance–covariance matrices across groups and multivariate normality of the variables (Hair et al. 1998). Moreover, the output from the analysis is very similar to regression and is therefore easier to draw inferences. Logit uses a binomial probability function for the dichotomous dependent variable and estimates whether it is one way or the other using an odds ratio. Unlike regression, where we try to minimize the squared deviations, in logit we maximize the likelihood of a firm adopting IS innovations (Premkumar 2003).

Table 2 illustrates the logit analysis' results, which indicate that the goodness of fit of the overall model is very good. The model R² is 43 percent, which means that 43 percent of the variation in the dependent variable is explained by the model. Nagelkerke R² and Cox & Snell R² are also measures of the goodness of fit. Hair et al. (1998) argues that Cox & Snell R² is reported less frequently because it cannot reach the maximum value of 1. The current model Nagelkerke R² is (.59), which is fairly high suggesting a good fit for the model. This value is inline with previous work (e.g. Premkumar 2003, Zhu et al. 2003). The predictive power of the model is very good with an overall accuracy of 81.4 percent.

As a test of robustness of the results, the model was tested on a sample of 92 observations, dropping ten observations arbitrarily (Hair et al. 1998). The coefficients and their statistical significance remained almost unaffected by this action, since there were marginal changes in the values of some coefficients but they were not strong enough to alter the results presented in the model with the full sample size. In addition, only marginal changes in the coefficients and their statistical significance occurred when the model was also restricted to only the statistically significant variables from the unrestricted model.

Independent Variables	β	Wald	Sig.	Exp (β)		
Constant	-8.22	9.81	.002	.00		
RA*	1.39	8.07	.004	4.03		
CM	.27	.49	.483	1.30		
CX	.28	.93	.335	1.32		
TR*	-1.63	8.09	.004	.19		
OB	-.11	.12	.723	.89		
TMS*	1.31	11.16	.001	3.71		
OR*	.61	4.39	.036	1.84		
ISE	.30	.52	.468	1.35	-2LL (Initial Model)	141.40
Size*	-1.51	8.00	.005	.22	-2LL (Final Model)	80.40
Industry	.55	1.81	.178	1.74	χ^2 (df) Final Model	60.84**
MS	.36	1.00	.317	1.43	χ^2 (df) Hosmer & Lemeshow test	11.06***
CP	.58	2.48	.115	1.79	Nagelkerke R ²	.59
EISE	.08	.03	.851	1.09	R ² _L	.43
Observed			Predicted		Percentage Correct	
			ES Adoption			
			Non-Adopters	Adopters		
ES Adoption	Non-Adopters	45		8	84.9	
	Adopters	11		38	77.6	
Overall Percentage						81.4

Table 2. Logistic Regression: Unrestricted Model (N = 102)

* Variables are significant at the 0.05 level of significance.

** Statistic is significant at 0.05 level of significance (p=0.000)

*** Test is non-significant at the 0.05 level of significance (p=0.198)

$$R^2_L = 1 - [-2LL (\text{Final Model}) / -2LL (\text{Initial Model})]$$

The model reveals that SMEs are not influenced by environmental factors as previous literature established, but rather they are influenced by technological and organisational factors. As indicated by logit regression coefficients, firms with a greater perceived relative advantage, a greater ability to experiment with ES before adoption, a greater top management support, a greater organisational readiness and a larger size are more likely to adopt ES.

7 DISCUSSION

Among the independent variables relative advantage, trailability, top management support, organisational readiness and size have been found to be significant determinants of SMEs' willingness to adopt ES. Surprisingly, environmental factors have been found to be insignificant. While this result contradicts the findings of a recent study by Buonanno et al. (2005) emphasising that the decision process regarding the adoption of ERP systems within SMEs is more affected by exogenous reasons than business-related factors, it is consistent with the findings of a study by Lee (2004) suggesting that SMEs are making adoption decisions based on internally important factors.

The most significant variable, which is constantly found to be critical in IS innovations' adoption, is *top management support*. In SMEs, the primary decision maker is the owner/manger of the business and his or her support is key in the adoption of new IS innovations. This consistent with prior studies (e.g. Premkumar 2003, Premkumar and Roberts 1999). Firms are argued to adopt technology only if they perceive a need for the technology to overcome a perceived performance gap or exploit a business opportunity (Premkumar and Roberts 1999). *Relative advantage* has been found to be a significant factor influencing SMEs' willingness to adopt ES. This is consistent with results from previous research that have found relative advantage to be a significant variable in the adoption of other IS innovations (e.g. Kuan and Chau 2001, Premkumar and Roberts 1999, Iacovou et al. 1995). *Trailability* has been found to be another significant technological factor influencing SMEs' willingness to adopt ES. Unlike other IS innovations, ES seem to be technologies that SMEs would like to experiment with before adoption. The availability of ES on a trial basis can assist SMEs in their decision to adopt these systems. This means that SMEs will be able to assess the performance of ES and would be able to resolve any problems before committing to fully implementing these systems (Ramdani and Kawalek 2007a). Results indicate that *size* still plays an important role and larger firms in small business category have a greater propensity to adopt ES. This is consistent with previous studies that have found size to be a critical factor in IS innovations' adoption (e.g. Premkumar and Roberts 1999, Thong 1999). Another significant organisational factor is *organisational readiness* suggesting that without sufficient technological and financial resources, SMEs will not be able to adopt ES. This is consistent with previous studies (e.g. Fink 1998, Iacovou et al. 1995).

The remaining technological variables (compatibility, complexity and observability) have been found to be insignificant attributes in SMEs' willingness to adopt ES. This is inline with previous studies (e.g. Kendall et al. 2001). The influence of organisational readiness variable may have paled the influence of *IS experience*, which have been found to be insignificant. This findings is inline with previous studies (e.g. Kuan and Chau 2001, Fink 1998, Iacovou et al. 1995). Surprisingly, non of the environmental characteristics seem to influence SMEs' willingness to adopt ES. These variables have been shown to be insignificant in previous studies (e.g. Lee et al. 2004, Kuan and Chau 2001, Premkumar and Roberts 1999, Thong 1999, Fink 1998).

Factors		IS Innovations					
		IT	IS	EDI	Communication Technologies	E-Commerce	ES
Technological	RA	Fink (1998)	Thong (1999)	Iacovou et al. (1995); Kuan & Chau (2001)	Premkumar & Roberts (1999)	Lertwongsatien & Wongpinunwatana (2003); Scupola (2003)	✓
	CM		Thong (1999)			Lertwongsatien & Wongpinunwatana (2003)	
	CX		Thong (1999)				
	TR						✓
	OB						
Organisational	TMS				Premkumar & Roberts (1999)	Lertwongsatien & Wongpinunwatana (2003)	✓
	OR	Fink (1998)		Iacovou et al. (1995); Kuan & Chau (2001)			✓
	ISE		Thong (1999)			Lertwongsatien & Wongpinunwatana (2003); Scupola (2003)	
	Size		Thong (1999)		Premkumar & Roberts (1999)	Lertwongsatien & Wongpinunwatana (2003)	✓
Environmental	Industry						
	MS						
	CP		Thong (1999)	Kuan & Chau (2001)	Premkumar & Roberts (1999)	Lertwongsatien & Wongpinunwatana (2003); Scupola (2003)	
	EISE	Fink (1998)					

Table 3. TOE factors influencing the adoption of different IS innovations (Only factors that are shown to be significant are listed in this table)

8 CONCLUSION

As illustrated in Table 3, IS innovations are highly differentiated technologies for which there is not necessarily a single adoption model (Ramdani and Kawalek 2007a). Contrary to what the literature states, SMEs are more influenced by technological and organisational factors than environmental factors in their willingness to adopt ES. These findings assert further that factors influencing the adoption of ES are different from factors influencing SMEs' adoption of other previously studied IS innovations. The major contribution of this study is statistically validating the factors influencing SMEs' willingness to adopt ES. Thus, it can be predicted that SMEs with a greater perceived relative advantage, a greater ability to experiment with ES before adoption, a greater top management support, a greater organisational readiness and a larger size are more likely to become adopters of ES.

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