

Firm Enacted Capabilities and Information Systems Adoption in Small and Medium-sized Enterprises

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Abstract

The adoption and utilisation of 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, which 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 resources and/or capabilities within SMEs. Consequently, the aim of this study is to empirically examining the SMEs enacted capabilities that may influence the success of IS adoption. In line with this objective, an IS adoption behaviour investigation at a deeper level is conducted particularly as to why some SMEs are able be enabled for use and actively utilise IS, while others fail to do so. A survey of 206 Malaysian SMEs was conducted. The IS examined was the government’s electronic procurement systems. Structural equation modelling (SEM) was used to test the research model. The findings are consistent with the notion that all SMEs have these enacted capabilities. The findings also indicate that strong enacted capabilities affect the SMEs’ ability to perform or assimilate IS related strategic change. Thus, some SMEs are more capable to leverage IS enabled change to their business advantage and respond rapidly to changes in the IS business environment.

Keywords: Enacted Capabilities, Information Systems, Small- and Medium-sized Enterprises, Adoption Behaviour

INTRODUCTION

Several information systems (IS) adoption research studies involving SMEs have identified factors that influence IS adoption behaviour by these enterprises. Closer inspection of these studies reveals that only limited factors were found to actually influence the adoption behaviour. External expertise and top management skills and knowledge are some of the important factors in IS adoption by SMEs (e.g., Chau and Hui, 2001; Thong, 2001; Iacovou et al., 1995). Perceived benefits is also an important factor affecting SMEs willingness to adopt IS (e.g., Levy and Powell, 2003; Wang and Tsai, 2002, Chau and Jim, 2002; Kendall et al., 2001).

A limitation of past research studies, however, is the dichotomous measure of adopters versus non-adopters, rather than the form or dimension of adoption (e.g., from the initial adoption decision, to enabled for use, to usage). The enablement and utilisation of an IS are critical and on-going challenges that require organisational capabilities that can be referred to as “enacted capabilities”. These enacted capabilities are controlled by the firms and enable the firms to conceive and implement strategies to improve the efficiency and effectiveness of conducting business by SMEs.

Consequently, this study attempts to capture the causal flow between perceived net benefits and enacted capabilities in predicting extent of enablement and utilisation of IS. This study also attempts to investigate the effect of attitude on adoption, from a competitive advantage perspective, towards extent of enablement and utilisation of an IS. The findings of this study are expected to assist SMEs and service providers to understand the IS adoption behaviour by SMEs that possess both organisational and individual perceptions and attitude.

THEORETICAL FOUNDATION: INFORMATION SYSTEMS ADOPTION BEHAVIOUR

The technology acceptance model (TAM) presented by Davis (1989) has been used extensively for IS research at the individual level (Prescott, 1995; Davis et al., 1989). TAM adapted the Theory of Reasoned Action (Ajzen and Fishbein, 1980) by incorporating information technology to explain belief-attitude-intention-behaviour usage. TAM postulates that perceived usefulness and perceived ease of use are of primary relevance for IS acceptance behaviours (Gefen and Straub, 1997; Davis et al., 1989). Moreover, perceived usefulness is influenced by perceived ease of use, i.e., considering other things being equal, the easier the IS is to use, the more useful it can be (Venkatesh and Davis, 2000). Prior studies have utilised TAM to identify crucial determinants of an individual’s intention towards accepting or adopting the IS. These studies have been conducted within a variety of organisations (e.g., Chau and Hu, 2002; Igarria et al., 1997). Prior IS studies have also used TAM to understand the antecedents of both perceived usefulness and ease of use. These studies focus on the normative beliefs and behavioural beliefs about using IS (Bhattacharjee and Premkumar, 2004; Venkatesh, 2000; Karahanna et al., 1999).

SMEs may be required by their trading partners to use a specific IS to maintain and perform business activities with their trading partners (e.g., Chau and Jim, 2002; Raymond and Bergeron, 1996; Iacovou et al., 1995; Premkumar et al., 1994). Many large organisations have insisted on their trading partners being electronic commerce capable (Mehrtens et al., 2001) or exercising pressure on SMEs to adopt inter-organisational IS (Premkumar and Ramamurthy, 1995). Thus, when the IS become crucial to the SME survival, attitudes will likely take on heightened importance and thus warrant consideration. The core of TAM states that perception of usefulness and ease of use will influence an individual’s intention to use IS, which ultimately influence actual usage behaviour through the mediating attitude construct. An extensive body of research on IS adoption behaviour using TAM has developed, tested and supported relationship among belief, attitudes, behavioural intention, and usage behaviour (Venkatesh and Davis, 2002; Taylor and Todd, 1995).

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 IS, if the individual chooses to do so (e.g., Mathieson et al., 2001; Venkatesh and Davis, 2000). While TAM have been consistently supported the IS adoption behaviour for volitional context (Venkatesh, 1999; Davis, 1989), it is not clear if the same relationships will hold when the behaviour model is mandatory.

Further studies into IS adoption by SMEs reveals that SMEs are concerned that the IS 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, 1999). Thus, SMEs adopt IS for the reason of relative advantage perceived by the owners or top managers (Lee and Runge, 2001). More recently, a firms’ technological opportunism has been introduced as an important determinant of IS adoption (e.g., Scupola, 2003; Caldeira and Ward, 2003). 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).

Extending this view of internal capabilities to an IS environment context support SMEs with the learning processes related to IS business strategies (Luftman, 2005). These internal capabilities can be referred to as enacted capabilities that allow SMEs to use and deploy IS strategies to accomplish established organisational objectives which determine the need for developing specific IS competencies (e.g., from non-active adopters to active adopters). This concept of enacted capabilities is informed by the resource-based view of the firm where internal capabilities that require an extended learning process, or are a result of a particular organisational culture are more likely to be unique to the enterprise and more difficult to imitate (Barua et al., 2004; Bharadwaj, 2000). These enacted capabilities are likely to be utilised differently in various organisations. Moreover, these enacted capabilities are integrated and coordinated in different ways, depending on the context of each organisation, including its history, people, and structural characteristics. Furthermore, these enacted capabilities are controlled by the firms and enable the firms to conceive and implement strategies that improve their efficiency and effectiveness (Luftman, 2000; Barney, 1991).

Thus, enacted capabilities are organisational attributes on how to combine and utilise resources, and are based on the learning, which are already embedded in the employed organisational routines (Scupola, 2003; Mata et al., 1995). In turn, these enacted capabilities will develop to be core competencies and ultimately become a source of competitive advantage (Cibborra et al. 2001). Therefore, organisations with strong enacted capabilities can both leverage IS enabled change to their business advantage and respond rapidly to changes in the IS business environment (Narayanan, 2001). This study considers enacted capabilities as organisational attributes resulting from processes that bring together the culture, trust in the technology, trust in trading partners, external experts support, and skills and knowledge of top management of the firms (Thong, 2001; Andreu and Cibborra, 1998) (Table 1). These enacted capabilities influence the firm ability to adopt and utilise IS. Complementarity among the enacted capabilities enhances resources value (Barney, 1991), while the aggregate impact of enacted capabilities is higher than any individual impact (Pavlou et al., 2005).

Hence, enacted capabilities are of value to the business and interact with the IS, organisational, and inter-organisational resources. For example, a firm's level of trust and relationships with trading partners, skills and knowledge, support from external experts, and organisational culture are deeply rooted in the organisational history and together with the IS resources are expected to impact the ability to be IS enabled, and utilise IS (Melville et al., 2004). Thus, investigating the enacted capabilities of SMEs is the key to understanding the IS adoption behaviour. These understandings help to explain how SMEs will behave in relation to their IS development strategy.

RESEARCH MODEL and HYPOTHESES

The development of the research model in this study incorporates TAM by extending the notion of attitude while also incorporating the notions of perceived usefulness and ease of use within a single perceived net benefits construct (Venkatesh, 2002; Venkatesh and Davis, 2000; Davis et al., 1989). Adoption also includes assimilation of the system within the organisation. The assimilation requires the SMEs to be enabled for use and utilise the IS. The research model in Figure 2 depicts the determinants that stimulate IS adoption behaviours by SMEs at the enablement and utilisation stages. The model conceptualises the relationships, at the time of enablement and utilisation between these constructs: enacted capabilities, perceived net benefits, attitude towards adoption at the time of adoption from a competitive advantage perspective, and IS adoption behaviour (i.e., extent of enablement and usage).

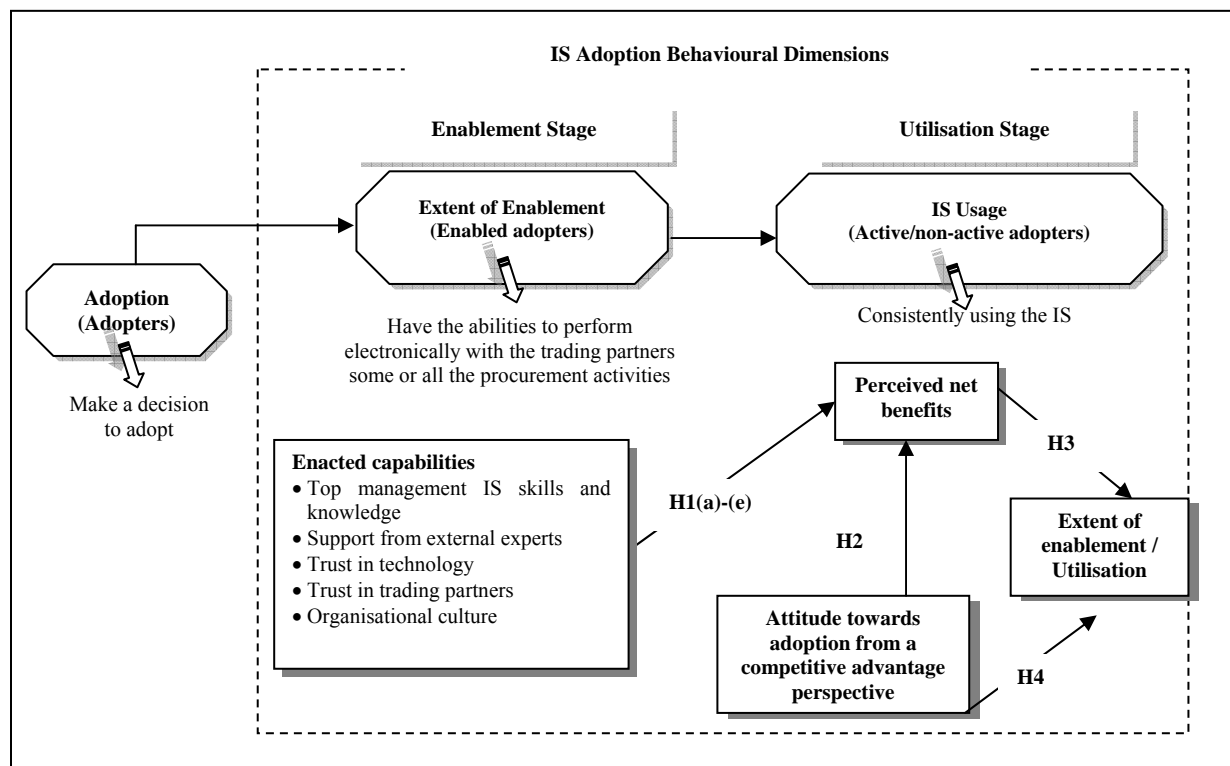


Figure 2: Proposed Model of Factors Affecting the Extent of Enablement and Utilisation of Information Systems

Enacted capabilities and Perceived net benefits

Within this study, perceived net benefits refer to the level of recognition on the relative advantage perception via specific benefits and/or reduction of costs arising from enablement and utilisation of IS. It is the owner-manager’s perceptions of the efficiency, effectiveness, and management control of enabling and utilising IS (Chau and Jim, 2002; Thong et al., 1996). At both these stages each factors of enacted capabilities are predicted to affect perceived net benefit (Iacovou et al., 1995). Organisations with strong enacted capabilities can leverage IS enabled change for business advantage and respond rapidly to changes in the IS business environment (Jasperson et al., 2005; Pavlou et al., 2005).

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 will be more comfortable to be enabled for use and utilise IS (Chang et al., 2003; Thong, 2001). In addition, SMEs are likely to rely on external experts during their IS implementations (e.g., Thong, 2001; Cragg and King, 1993). Thus, the support from the external experts’ makes it easier for SMEs to understand the perceived net benefits that can be realised from becoming enabled and utilising IS (Lee, 2004; Attewell, 1992).

Businesses are also concerned about information theft and consider conducting transactions on-line to be risky (Ratnasingham, 2003; Pavlou, 2002). Prior studies on trust in technology assert that perceived net benefits such as security and quality can be achieved by properly managing the security-based mechanisms (e.g., encryption, UserID and password) (Ratnasingham, 2003, Kendall et al., 2001). Prior studies also reveal that a lack of trust in trading partners during IS 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). Firms lacking previous experience or relationships with the trading partners or potential partners are likely to perceive lower net benefits in relation to the adoption of IS (Pavlou, 2002).

SMEs cultural orientation can be conceptualised in terms of their strategic posture that is defined by Covin and Slevin (1991) as the competitive orientation of a firm. These perceptual stances can range from the highly positive entrepreneurial stance to one of conservatism and resistance to change. SMEs with strong entrepreneurial culture are viewed as those in which the top managers or owners are willing to take risks and to favour change and if it leads to competitive advantage (Weaver et al., 2000). SMEs whose culture is characterised as entrepreneurial will most likely be able to deal with uncertainty, and thus, would perceive high benefits in adopting and utilising IS (Curry and Moore, 2003; Hoffman and Klepper, 2000). In general, it is anticipated that organisations with strong enacted

capabilities are more able to see the advantages and disadvantages of adoption, and therefore are able to evaluate the perceived net benefits. Thus the following hypotheses are posited;

H1(a): Top management information systems skills and knowledge at the enablement (utilisation) stage has a positive association with perceived net benefits of IS at the enablement (utilisation) stage.

H1(b): Support from external experts at the enablement (utilisation) stage has a positive association with perceived net benefits of IS at the enablement (utilisation) stage.

H1(c): Trust in technology at the enablement (utilisation) stage has a positive association with perceived net benefits of IS at the enablement (utilisation) stage.

H1(d): Trust in trading partners at the enablement (utilisation) stage has a positive association with perceived net benefits of IS at the enablement (utilisation) stage.

H1(e): A more entrepreneurial organisational culture has a positive association with perceived net benefits of IS at the enablement (utilisation) stage.

Attitude and Perceived net benefits

A classic theory of TAM posits that cognitive beliefs¹ predict attitude, i.e., attitude occurs only after considerable cognitive operation have been accomplished (Davis, 1989; Fishbein and Ajzen, 1975). 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 are “separate and partially independent systems” (Zajonc, 1984), and that attitude could precede cognitive process in a behavioural chain. Specifically, the initial attitude reaction may lead to them to mood consistent information, which is used to form associated cognitive structures (Sun and Zhang, 2005; Bagozzi et al., 1999). 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 the enablement and utilisation stage, and thus, see the increased benefits associated with the system at these stages (Guimaraes and Igbaria, 1994). Thus, the following hypothesis is posited;

H2: Attitude towards adoption from a competitive advantage at the adoption stage has a positive association with perceived net benefits at the enablement/utilisation stage.

Perceived net benefits and Adoption behaviour

There is much evidence that the adoption and utilisation of IS is driven to a large extent by perceived net benefits (Lee, 2004; Al-Gahtani and King, 1999). Perceived net benefits refers to the top management perceptions of the strategic² and operational³ value in adopting and utilising the IS (e.g., Iacovou et al., 1995). If the perceived benefits cover the perceived cost, a firm is likely to favour the decision to adopt, be enabled, and utilise the IS (e.g., Kendall et al., 2001; Igbaria et al., 1997). This study postulate that perceived net benefits at both these stages are predicted to affect the IS adoption behavioural responses: (1) extent of enablement and (2) usage. Thus, the following hypothesis is posited;

H3: Perceived net benefits at the utilisation stage have a positive association with extent of enablement (usage) of IS.

¹ Cognitive belief refers to one’s perception of an object’s qualities such as its relevance to one’s goals and causal antecedents (Russel, 2003).

² Relate to the development of business strategies through the building of external relationships with customers and competitors (Iacovou et al., 1995).

³ Refer to improvements made in the internal functioning of the organisation apparent in everyday activities, which include improving data accuracy, improving security of data, improving operation efficiency, speeding up application processes and reducing clerical errors (e.g., Soliman, 2003; Kendall et al., 2001; Thong, 1999).

Perceived net benefits and Adoption behaviour

Rogers (1995) and Zmud (1984) assert the importance of the relationship between attitude of the organisation towards an innovation and successful adoption. The assertion is supported by Melone (1990) who suggested the importance of attitude as a candidate for satisfaction, i.e., a surrogate for IS success adoption and utilisation. Hence, attitude is central to behavioural theory, and many prior studies considered attitude to be significant predictor of adoption behaviour (e.g., Bagozzi, 1992; Ajzen and Fishbein, 1980). This study expects that a positive attitude, at the time of adoption will result in an organisation being more likely to be progressing through the enablement and utilisation stages. Thus, the following hypothesis is posited;

H4: Attitude towards adoption from a competitive advantage has a positive association with extent of enablement (usage) of IS.

RESEARCH METHOD

A survey (and a number of follow-up interviews) of CEOs/owners from Malaysian SMEs was conducted in December 2004 to January 2005. The IS examined was the Malaysian government's electronic procurement systems, i.e., 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. After registering and/or adopting, adopters would normally proceed to the enablement stage, whereby they obtain the abilities to perform electronically with the trading partners some or all the procurement activities and ultimately use the system. At the time of the study, out of 61,000 SMEs that registered for the ePerolehan system, about 7,736 SMEs were ePerolehan enabled.

The nine constructs identified in the research model were measured. Wherever possible, multi-items within each construct were developed and adapted from existing scales previously validated within the IS literature (Appendix 1). All items were measured using 7-point Likert scales representing a range from (1) strongly disagree to (7) strongly agree, except for extent of enablement and usage of IS being assessed by a range of frequency of use from (1) none at all' to (7) all the time.

Prior to distribution, the instrument was tested for construct validity and ease of answerability, and pilot tested. 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 percent⁶. 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 ePerolehan for more than one year. The distribution of the respondents' demographic information was a reflection of the actual profile of SMEs in Malaysia (Source: 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.

DATA ANALYSIS

Partial Least Squares Approach

This study used Partial Least Squares (PLS)⁴ to examine the measures and research model. PLS models are analysed and interpreted in two stages: (1) assessment of the adequacy of the measurement model; and (2) assessment of the structural model⁷. The adequacy of the measurement model is based on its internal consistency and reliability, convergent validity, and discriminant validity. An initial factor analysis was performed. All constructs appeared to be reliable and valid except the organisational culture construct. Numerous tests were then conducted and it was determined that three of the items (relating to bureaucratic structures) should be removed. After the omission of the three items in the organisational culture construct, the measurement model was again examined and it subsequently exhibited adequate internal consistency reliability, convergent, and discriminant validity⁸.

⁴ 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 (Bhattacharjee and Premkumar, 2004; Hulland, 1999). Given the small sample size of 206 PLS is deemed most appropriate.

RESULTS

Path analysis - Enablement stage

Figure 3(a) shows that only one of the paths from enacted capabilities factors i.e., top management IS skills and knowledge to perceived net benefits was significant ($\beta = 0.365$, $p < 0.001$), with 31.8 percent of the variance is explained. During the follow-up interview, these enabled adopters were asked to rank from 1 (i.e., very important) to 5 (i.e., least important) the influence of the five enacted capabilities on perceived net benefits at the enablement stage. The interview results supported the quantitative findings that top management IS skills and knowledge (100 percent of the adopters interviewed ranked the item between 1 and 3) affected perceived net benefits.

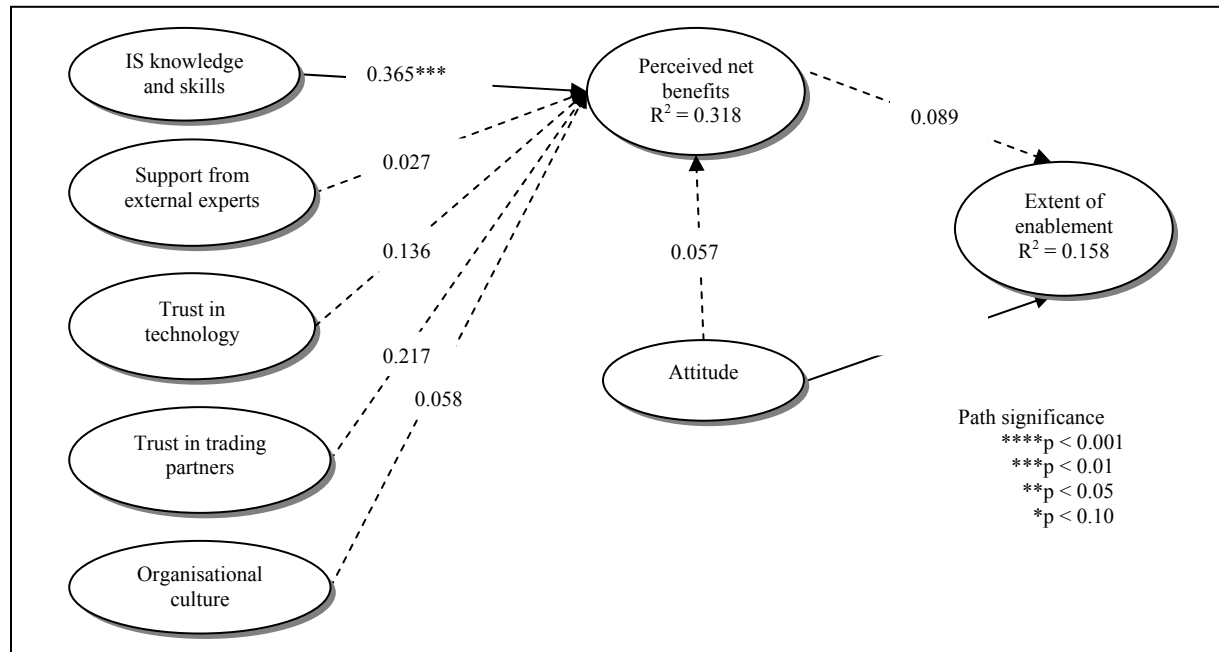


Figure 3(a): PLS Analysis of Overall Proposed Structural Model at the time of Enablement

Interview results also indicated trust in trading partners (89.5 percent ranked the factor between 1 and 3) and trust in technology (63.2 percent ranked the factor between 1 and 3) affected perceived net benefits. Thus, the interview results provide support for the associations between these three enacted capabilities on perceived net benefits. Some 42.1 percent of enabled adopters interviewed have ranked organisational culture between 1 and 3 towards it affects on perceived net benefits. Thus, there is marginal support for the association. There was no statistical or support from the interview for the association between support from external experts to perceived net benefits.

There was no significant path from attitude to perceived net benefits. When these enabled adopters were asked about their attitude towards adoption from a competitive advantage perspective, the common responses were that they have a positive attitude about the whole idea of the system. They further stated that they do believe the system would provide them with the competitive advantage needed to be successful in the current business environment. However, they stress that even though they have a positive attitude about the system, they are not satisfied with the implementation of the system, and hence, the perceived net benefits of actively using the system. The phenomenon could further be explained by the following two comments (representative of the majority of respondents); *“positive about being enabled in order to succeed in the business, but the trading partners must be more serious in terms of its implementation”* (interviewee 9); and *“still have positive attitude as during adoption, and the potential of the system in order to be successful in business, but implementation need to be smoother”* (Interviewee 12). The path from perceived net benefits to extent of enablement was not significant either.

During the follow-up interviews, the enabled adopters were asked what the most important benefits they perceived from becoming enabled for use. The majority of the enabled adopters interviewed stated, *“time and cost saving”*, *“increase revenue”*, *“would speed up payment”*, and *“accuracy of transaction”*. From these statements, it seems that these adopters do perceive the benefits of being enabled for use. However, these perceived net benefits do not have a significant influence on the extent of enablement. Perhaps, this phenomenon could be explained by this

common comment when asked the reason for becoming enabled, “*main source of revenue, thus, need to be enabled for use to be able to conduct business with government*”. This comment informs us of the condition under which this factor becomes dominant and potentially overshadowing perceived net benefits.

The path from attitude to extent of enablement was found to be significant ($\beta = 0.377$, $p < 0.001$), with 15.8% of the variance in extent of enablement explained. During the follow-up interviews, these adopters were asked what motivated them to be enabled for use, and some of the responses were, “*business opportunity*” (Interviewee 4); “*to compete in current business environment*” (Interviewee 18); and “*secure business with the government*” (Interviewee 20). These remarks indicate that these adopters had a strong belief of what the system had to offer in terms of opening new business opportunities.

The refined model (Figure 3(b)) resulted in a slightly higher standardised beta (β) and significant for top management IS skills and knowledge ($\beta = 0.370$ $p < 0.001$) to perceived net benefits. The path from trust in trading partners to perceived net benefits emerged significant ($\beta = 0.279$ $p < 0.01$). Both factors jointly explained 30.6 percent of the total variance in perceived net benefits. The path from attitude to extent of enablement is also still significant ($\beta = 0.314$, $p < 0.001$). Three new paths, i.e., support from external expert ($\beta = 0.223$, $p < 0.01$), trust in technology ($\beta = 0.195$, $p < 0.01$), and organisational culture ($\beta = 0.159$, $p < 0.10$) to extent of enablement emerged as significant. Taken together, these enacted capabilities and attitude explained 29 percent of the variance in extent of enablement variable. Thus, while the enacted capabilities do not affect extent of enablement via perceived net benefits, they appear to affect extent of enablement directly. The refined model had an effect size f^2 of 0.02 for perceived net benefits and 0.15 for extent of enablement, which indicated small to moderate effect. The moderate effect suggests the substantial impact support from external experts, trust in technology and organisational cultures have on extent of enablement.

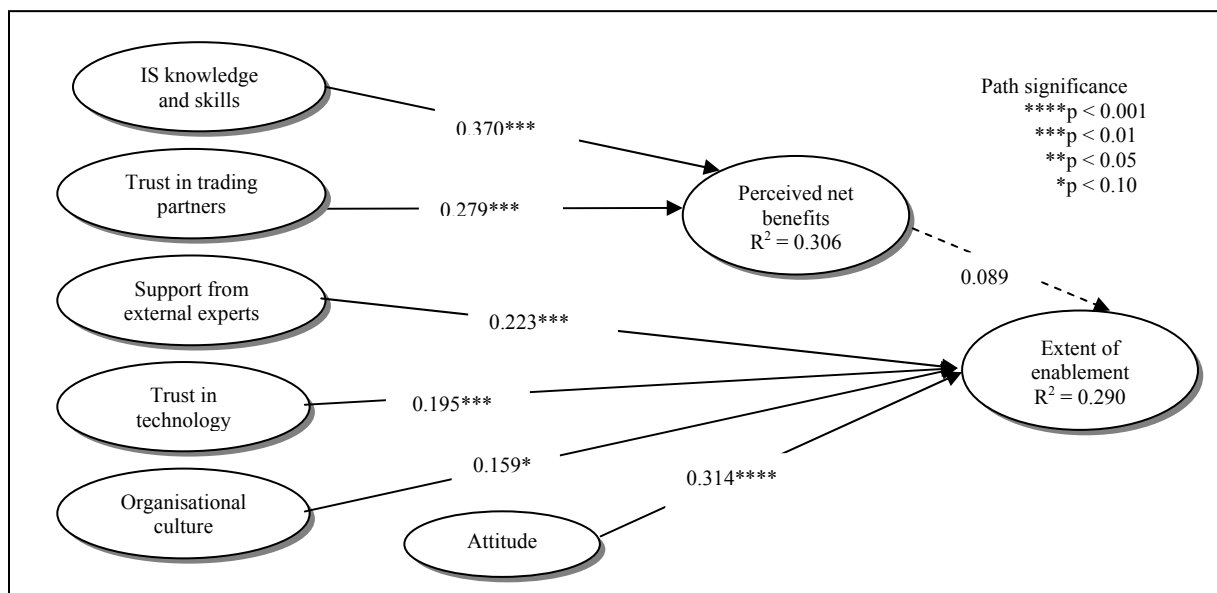


Figure 3(b): PLS Analysis of Refined Structural Model at the time of Enablement

Utilisation stage – Path analysis

Figure 4(a) shows that three of the paths from enacted capabilities to perceived net benefits were significant (top management IS skills and knowledge ($\beta = 0.425$, $p < 0.01$), support from external experts ($\beta = 0.218$, $p < 0.05$) and trust in trading partners ($\beta = 0.280$, $p < 0.001$). These enacted capabilities jointly explained 73.3 percent of the variance in perceived net benefits. During the follow-up interviews, the enabled active adopters were asked to rank from 1 (i.e., very important) to 5 (i.e., least important) the influence of these enacted capabilities on perceived net benefits. The interview results supported the quantitative findings that top management IS skills and knowledge, support from external experts and trust in trading partners affected perceived net benefits. One hundred percent of the enabled active adopters interviewed ranked these factors between 1 and 3. Thus, both the quantitative and interview results provide strong support.

There was no statistical or support from the interview for the paths from trust in technology and organisational culture to perceived net benefits. The path from attitude to perceived net benefits was not significant ($\beta = 0.018$, $p > 0.10$). The association between attitude and perceived net benefits perhaps can be explained by the following interview result. When these enabled active adopters were asked whether their attitude towards adoption at the time of adoption from a competitive advantage perspective had changed, their common response was their attitude about what the system had to offer in order to be successful in the current business environment was still positive and the same as at the time of adoption. However, they added that their attitude towards the implementation of the system was not positive. Hence, the favourable attitude towards adoption and active usage from a competitive advantage perspective does not have an effect on perceived net benefits.

The paths from perceived net benefits ($\beta = 0.378$, $p > 0.01$) and attitude ($\beta = 0.418$, $p < 0.01$) to usage were significant. These factors combined explained 25.6 percent of the variance in usage. Perhaps the association between perceived net benefits and usage is best explained by the following remarks. When asked what motivated these adopters to actively use the system, they responded, “increase self value of our firm, fast documentation and wider market coverage” (Interviewee 19); “time and cost efficient because of documentation on-line and broader business opportunity” (Interviewee 20) and “fast ordering and invoicing and wider sales coverage” (Interviewee 21).

The association between attitude and usage perhaps is reflected in the following remarks when asked about what they would say if any of their peers were to seek advice about the system. Some of the responses were; “it is still in the early stage of implementation, hopefully it will get better” (Interviewee 19) and “it is still new, and with further improvement on it implementation by the government, eventually it will be okay, now we just have to make do with the implementation” (Interviewee 20). These comments suggest these adopters do have a positive outlook on the competitive advantage that could be achieved by adopting the system for future success and prosperity of their business. Thus they are actively using the system, because of the positive attitude on the competitive outlook of the system.

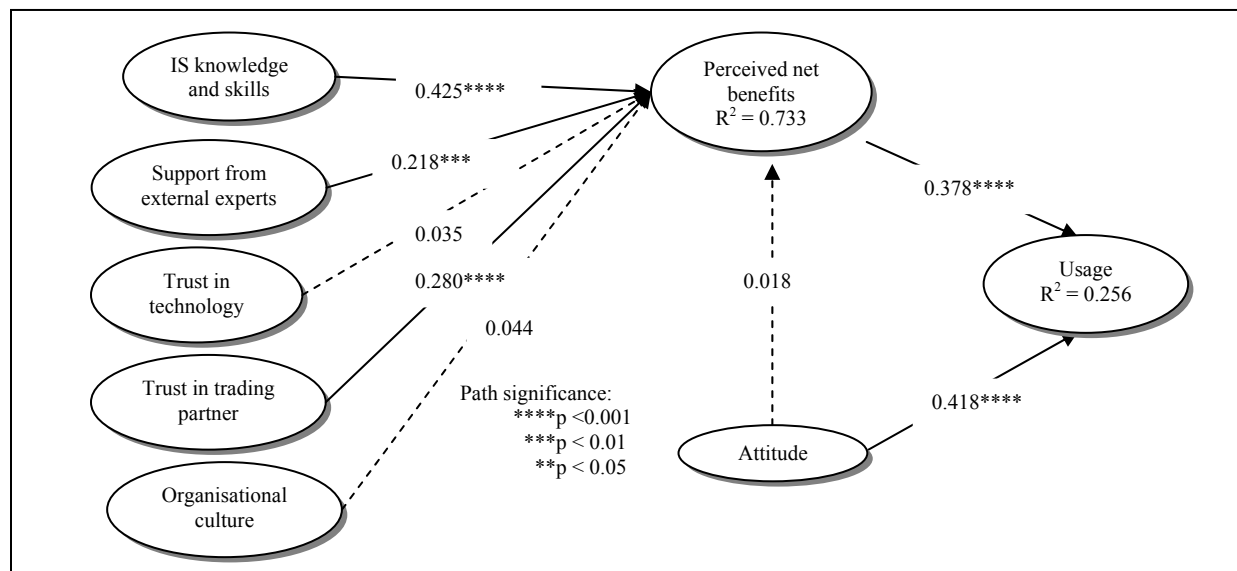


Figure 4(a): PLS Analysis of Overall Proposed Structural Model at the time of Utilisation

The refined model (Figure 4(b)) resulted in slightly higher standardised beta (β) and significant for top management IS skills and knowledge ($\beta = 0.461$, $p < 0.001$), support from external experts ($\beta = 0.214$, $p < 0.001$) and trust in trading partners ($\beta = 0.288$, $p < 0.001$), with 72.9 percent of the variance in perceived net benefits is explained. The paths, perceived net benefits ($\beta = 0.377$, $p < 0.01$) and attitude ($\beta = 0.425$, $p < 0.001$) to usage, are also still significant. Three new paths from support from external experts ($\beta = 0.269$, $p < 0.001$), trust in technology ($\beta = 0.218$, $p < 0.001$), and trust in trading partners ($\beta = 0.421$, $p < 0.001$) to usage also emerged as significant. Taken together, these enacted capabilities, perceived net benefits and attitude combined explained 45.8 percent of the variance in usage. The refined model had a small effect size f^2 of 0.01 for perceived net benefits, but a large effect size f^2 of -0.27 for usage suggesting a strong and substantive impact trust in technology, trust in trading partners and support from external experts as stimulators of usage.

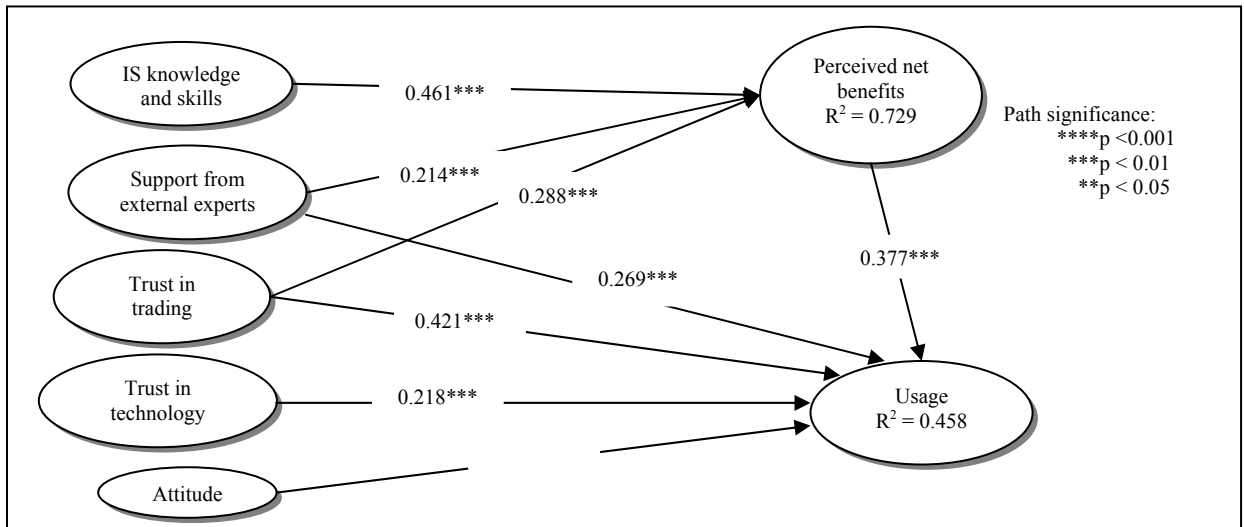


Figure 4(b): PLS Analysis of Refined Proposed Structural Model at the time of Utilisation

DISCUSSION

Enacted capabilities and Perceived net benefits

Top management IS skills and knowledge together with trust in trading partners dominate the effect on perceived net benefits at all stages of adoption behaviour. The findings suggest SMEs with more knowledge and more skilful with the IS are more likely to perceive the potential benefits the system has to offer. In addition, having 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 and ultimately lead to the positive adoption behaviour (e.g., Ratnasingham, 2003; Shankar et al., 2002).

The findings support that the support SMEs received from external experts does influence adopters' perceived net benefits at the utilisation stages. The support from external experts makes it easier for SMEs to understand the perceived net benefits that can be realised from the utilisation of IS, and is similar to finding from previous studies (Lee, 2004; Venkatesh and Davis, 2000). On the contrary, support from external experts was not a contributing factor to perceived net benefits at the enablement stage. 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. As Kwon and Zmud (1987) argue the importance of support from external experts in evaluating perceived benefits at the enablement stage becomes less significant when SMEs' top management have sufficient IS skills and knowledge during the enablement stage.

Attitude, Perceived Net Benefits, and Adoption Behaviour

There was no direct association from attitude to perceived net benefits, rather the proposed indirect effect of attitude on the adoption behaviour via perceived net benefits. The findings suggest that this instance of attitude at the time of adoption is one of the salient antecedents to extent of enablement and usage of IS, and are consistent with those from previous IS studies (e.g., Chau and Hu, 2002). At the utilisation stage, usage is affected by perceived net benefits, whereas the perceived net benefits at the enablement stage do not affect extent of enablement. One possible explanation could be that at the enablement stage, rather than trying to evaluate the benefits of being enabled, SMEs focus on just becoming enabling for use as they have made the decision to adopt the system in the first place. On the other hand, at the utilisation stage, SMEs may try to rationalise their usage behaviour by examining the benefits that could be realised to reinforce their adoption decision (Karahanna et al., 1999).

Enacted Capabilities and Adoption Behaviour

It seems therefore, that certain enacted capabilities have a direct effect on adoption behaviour responses, rather than the indirect effect through perceived net benefits. Support from external experts and trust in technology are salient for the extent of enablement and utilisation. SMEs usually seek support from external experts to compensate for the lack of internal IS skills and knowledge. This finding is consistent with, and reaffirms the findings of, previous studies (e.g. Chang et al., 2003). 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. It is also evidenced in this study and in prior studies (e.g., Ratnasingham, 2003; Shankar et al., 2002) that the perception of trust in trading partners becomes important in sustaining utilisation of the system.

CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

This study found that organisations' enacted capabilities display important roles in the adoption behaviour of IS. Apart from requiring good ideas and financial resources, SMEs also require an extended learning process that is unique to them helping them to efficiently and effectively adopt and utilise IS. Although, this study deals with adoption in only one country, Malaysia, the study found that existing models for IS adoption developed within other countries are supported to some extent. This study provides preliminary evidence suggesting perceived net benefit, extent of enablement, and usage of IS are determined by the enacted capabilities. Both top management IS skills and knowledge and trust in trading partners influence perceived net benefits, and are significant. Furthermore, the results may suggest the existence of an interaction effect between organisational culture, trust in technology and support from external experts.

The findings also have important practical implications. Enablement and utilisation of innovation IS requires identifying and understanding the enacted capabilities that are unique to SMEs. Such an understanding can assist system developers in the planning of intervention mechanisms, through training. A better understanding of the technological safeguards during training session will increase the level of trust in the technology. Furthermore, the system developers need to focus on building SMEs trust in trading partners. Thus, systems developers may need to join forces with trade associations to enhance SMEs perceptions of the competency, integrity and reliability of the trading partners.

It is important to evaluate the study's results and contributions in light of its limitations. First, the use of government suppliers and one product may limit the generalisability of our findings. Thus, replication is desirable. Second, the general caveats associated with the use of questionnaires apply. Third, perceived net benefits and IS innovation are dynamic, thus the use of cross sectional research may not fully capture the complexity or periodicity of the enablement and utilisation process.

There are a number of opportunities for future research with three mentioned here. First, a longitudinal case study would provide more conclusive evidence as to process through which enacted capabilities affect everyday business practices. Second, future research is needed to better conceptualise the influence of organisational culture and the dimension of cultural orientation within SMEs to ensure the proper domain and measurement that represents organisational culture of SMEs. 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.

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APPENDIX I

Table 1: Measurement of Constructs

Construct	Measure assesses	Measure	Source
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Attitude towards adoption from a competitive advantage perspective	Degree to which SME has a positive feeling or disposition towards adoption from a competitive perspective to be successful in today business environment.	Being able to use to use electronic procurement systems is wise/foolish step <ul style="list-style-type: none"> • Dealing with trading partners • Maintain trading partners • Efficiency and effectiveness in engaging business transaction • Successful and to remain competitive 	Chau and Hu (2002); Venkatesh and Davis (2000) as modified by researcher
Perceived net benefit	Degree to which a benefit or reduced cost is perceived in adopting and utilising electronic procurement system	<ul style="list-style-type: none"> • Lower business cost • Wider market coverage • Importance of doing business on the Internet in the future • Reduce administrative cost • Reduce order fulfilment cycle time • Lower inventory levels • Prepare organisations for increased technological collaboration and planning with business partners 	Mehrtens et al. (2001); Iacovou et al. (1995) as modified by researcher
Extent of enablement	Degree to which the enterprise has the ability to successfully implement aspects of electronic procurement system	The ability to: <ul style="list-style-type: none"> • receive and process purchasing and selling activities with buyers • process and send invoices • receive payment digitally • provide product catalogue 	Davila et al. (2003) Develop by researcher
IS usage	Degree to which the enterprise uses electronic procurement system to conduct electronic procurement activities	Frequently using electronic procurement systems to <ul style="list-style-type: none"> • receive and process purchasing and selling activities with buyers • process and send invoices • receive payment digitally 	Searle (1995) Develop by researcher
Top management information systems skills and knowledge	Degree to which top management has the capacity to understand, appreciate and co-ordinate the technological needs of the business.	<ul style="list-style-type: none"> • Information technological trends • Implementation, operation and maintenance issues relating to IS • Software requirements • Organisational information systems requirement 	Yen et al. (2003); Thong (2001) as modified by researcher
Support from external experts	Degree to which the enterprises has access to high qualified information systems experts belonging to external organisations	<ul style="list-style-type: none"> • Adequacy and quality of technical support during adoption • Adequacy and quality of training provided • Relationship with other parties in the project (chief executive officers, users) 	Thong et al. (2001); Caldeira and Ward (2003) as modified by researcher
Trust in technology	Degree to which the enterprise collectively assesses the technological security aspects of the IS	<ul style="list-style-type: none"> • Protection of electronic procurement transactions • Transaction accuracy and assurance • Transaction quality of being authoritative, valid, true, genuine, worthy of acceptance 	Ratnasingham (2003) as modified by researcher
Trust in trading partners	Degree to which the enterprise collectively assesses it trading partner will perform potential transactions as expected, irrespective of their ability to fully monitor the trading partners	<ul style="list-style-type: none"> • Reliance upon the ability, skills, knowledge, and competence of trading partners • Reliance upon the care, concern, and honesty shown by trading partners 	McKnight et al. (2002); as modified by researcher
Organisational culture	Type of organisational culture that exists in the business	<ul style="list-style-type: none"> • Innovation and risk taking • Attention to detail • Orientation towards outcomes and results • Aggressiveness on growth and rewards or the lack of it • Collaboration in teams • Orientation towards people • Predisposition towards change 	Wallach (1983) as modified by researcher