

# Effects of Learning Capacity and Knowledge Base on Executive Decision Formation for IT Adoption: An Empirical Study of Small and Medium-Sized Organizations

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## **Abstract**

*This paper investigates the influence of organizational knowledge resource and learning capacity on the assimilation of information technology in small business context. We propose that in small business context organizational assimilation of new technology is dependent on the top executives' decision to adopt the technology, which in turn is affected by their attitudes toward the technology. A survey methodology was used. Our empirical study*

*validates that top executives' attitudes toward an information technology innovation mediate the influence of organizational learning capacity and knowledge resource on top executives' adoption intention. The study has important implications for the research of technological advancement of small businesses. It also sheds some light on the research of organizational learning and information technology diffusion.*

### **Keywords**

Organizational Knowledge, organizational learning, organizational learning capacity, IS innovation adoption, small-and-medium-sized businesses (SME)

## **1. Introduction**

Historically, small-and-medium-sized businesses (SME) have played important role in industrial evolution and macroeconomic prosperity. Recent global economy has seen the birth of more and more entrepreneurs, partly driven by the accelerating information technology development and promotional policies implemented by many countries. Despite their contribution to the stability and prosperity of economy, SMEs are generally confronted with more environmental threats and internal constraints in their competition with large organizations. With growing penetration into business operations, information technology has become an integral part of the mix of forces contributing to business environment turbulence. If appropriately deployed and used, information technologies could produce many strategic and operational benefits for organizations. Conversely, organizations may lag behind if they fail to respond to new information technology developments. Thus whether to adopt and innovate with new information technology is one of the important decisions faced by SMEs.

Past research suggests that SMEs would have different mechanisms in decision making compared to large companies due to their centralized structure (Cohen & Lindberg 1974). Top executives of SMEs exert determining influence in organizational course of action, especially with respect to innovation with information technology. Thus SMEs' assimilation of information technologies is generally studied through the examination of top executive decision on whether to adopt and implement the information technology of interest (e.g., Thong 1999).

Top executives' decisions are made based on their organizations' resources and capabilities. In the assimilation of information technology increasingly characterized as knowledge intensive innovation, organizational knowledge bases and learning capacity have emerged as salient factors in the context of large organizations (Fichman & Kemerer 1997). However, their effects on organizational innovation with information technology in small businesses remain unresolved because the findings obtained in the research of large organizations cannot be readily generalized to SME.

This paper attempts to investigate the influence of organizational knowledge bases and learning capacity on SMEs top executives' intention to adopt information technology innovation. Furthermore, it also constructs and empirically tests the underlying mechanism through which organizational knowledge bases and learning capacity exert their influence. It provides implications for SME research by explicating how the resources and learning capacity of an organization affect its innovative behaviour (Cohen & Lindberg 1974). This study also enhances the research on organizational learning by extending findings in large organizations to SMEs.

## Theoretical Background and Hypotheses

### Decision Making in Small Businesses and The Implications for Technology Adoption

Small businesses are generally identified by their size, annual sales and fixed assets (Thong 1999). In line with past studies (e.g., Thong 1999), this study defines small businesses as companies with less than 100 employees. The inherent characteristics of small businesses make their operations different from those of large corporations. Small businesses show relatively greater centralization in decision making due to their simple and highly centralized structure (Cohen & Lindberg 1974). Top executives in such businesses are usually the owner of the business and play a dominant role in making critical decisions (Miller & Toulouse 1986), implying that technology assimilation for competitive advantage in small business is generally initiated and realized through the CEOs' decision. Therefore, top executives' decision on whether to adopt a particular information technology should be investigated when we explore what underlies technological innovation in small businesses.

Small business managers tend to make decisions self-dependently. They do not often seek professional assistance from consultants. Their decision-making processes are more intuitive, based on "guess-work" and less dependent on decision models. This suggests that, to some extent, top executives in small businesses may generally experience the same psychological process to arrive at the final decisions for their whole organizations as a common human being does in determining whether to perform a particular behaviour, although they may be exposed to more external variables and constraints.

The Theory of Reasoned Action (Ajzen & Fishbein 1980) has made fruitful contribution to the enquiry into the psychological process underlying decision making. In psychological decision making process, an individual's attitude toward a particular behaviour, i.e. whether the behaviour is favourable, has significant contribution to his/her intention towards performing that behaviour, which in turn is the immediate determinant of his/her actual behaviour. Thus, it suggests that in the context of small business technological innovation assimilation, the managers' attitude and intention toward the adoption are factors worth investigating.

Applying TRA to small business managers' decision formulation processes in new complex technology assimilation, it is arguable that if a manager's attitude toward the information technology is positive and favourable, believing that it will benefit his/her organization through reducing cost, increasing efficiency and effectiveness, improving supplier and customer relationship and better positioning in competition, he/she would dictate his/her firm to act more aggressively in technology adoption. Thus we propose that a manager's attitude toward the focal technology would contribute positively to his/her intention to adopt the technology in his/her firm.

*H1: In the context of SME, managers' intention to adopt complex technology in their organizations is positively related their attitudes towards adopting the technology in their organizations.*

## **Organizational Knowledge Base and Organizational Innovation Adoption**

Technology diffusion research posits that organizations will face knowledge barriers imposed by new knowledge embedded in technologies (Attewell 1992). To overcome the barriers, organizations should acquire sufficient knowledge to attain the level required by the new technologies. This knowledge acquisition process can be greatly facilitated if the potential organization possesses relevant knowledge.

Related knowledge is the extent of abstract knowledge, know-how, and skills possessed by the organization in arenas related to the focal innovation. It is found that new knowledge is more quickly learned if it shares elements with either an individual's or an organization's already acquired knowledge (Zander & Kogut 1995). On the other hand, cognitive limitations at individual, group and organization level will impede the occurrence of knowledge development and learning.

Individuals' knowledge is an essential component of an organization's collective knowledge. Cognitive theorists believe that knowledge acquisition cannot be realized by simply exposure to new knowledge. Some related cognitive pattern or frame of reference must first exist, which means a large body of knowledge must be accumulated (Leahey & Harris 1997). Only under such circumstances can new concepts be appropriately organized in the frame; the linkages and interactions of new and pre-existing concepts, which are necessary to new knowledge generation and development, can occur. With a well-established structure of reference, new knowledge acquisition can be significantly facilitated.

At the organization level, it is observed that the effect of prior related knowledge on new knowledge learning and acquisition has two dimensions. First it can promote an organization's new knowledge absorptive capacity (Cohen & Levinthal 1990). Second it can diminish the distance an organization must travel to obtain the bundle of knowledge to be acquired (Fichman & Kemerer 1997).

Empirical investigations on information technology assimilation from a variety of perspectives reveal that knowledge about the technology such as its benefits, compatibility, and complexity etc. is always a strong antecedent of organizational adoption (e.g., Teo 1998; Chau 2001). This suggests that for an organization to adopt a new technology necessary knowledge about the technology must exist. Thus it can be inferred that if the repository of related knowledge has not attained necessary level, the managers might be reluctant to adopt knowledge-intensive technology due to the associated learning burden to narrow the knowledge gaps. However, the managers' concern would be greatly alleviated if a small business possesses necessary knowledge because the knowledge barriers have been significantly reduced. Therefore, managers in small firms with the presence of technological readiness would show more favourable attitude toward adopting the technology and greater predisposition toward adopting the technology in their firms.

*H2: In the context of SME, the knowledge related to the focal technology that organizations possess is positively related to their managers' attitude toward adopting complex technology in their organizations.*

*H3: In the context of SME, the knowledge related to the focal technology that organizations possess is positively related to their managers intention to adopt complex technology in their organizations.*

## **Organizational Learning and Organizational Innovation Adoption**

Conceptualisation of the diffusion of complex innovations, including information technologies, from organizational learning perspective has been empirically validated (Fichman & Kemerer 1997). Learning is a common and natural living state of any organization to keep itself viable in the turbulent business environment. But organizations perform differently in learning processes. Researchers have attributed this phenomenon to the organizational ability to encourage, initiate, facilitate and sustain continuous learning, which is termed as organizational learning capacity by Hult and Ferrell (1997).

Distilling from previous works (e.g., Choo 1998, Hult & Ferrell 1997, Schein 1999), four orientations reflecting an organization's learning capacity can be discerned: *systems orientation*, *organizational climate for learning orientation*, *knowledge acquisition and utilization orientation*, and *information sharing and dissemination orientation*. *Systems orientation* reflects the extent to which organizational key actors think broadly about the interdependency of organizational variables (Nevis et al. 1995). A systems orientation focuses on structuring and making sense of each organizational phenomenon from the perspective of the organization as a whole (Hult & Ferrell 1997). The importance of systems thinking has long been highlighted in research on organizational learning. Senge (1990) ranked it first in terms of importance among the characteristics of a learning organization. Systems orientation is crucial to the extent that it can guide an organization to move beyond the adaptive to the generative learning, where its assumptions, beliefs and knowledge base are transformed (Senge 1990). In addition, a systems orientation fuses the other three orientations into a coherent paradigm on which an organization depends to pursue consistent development.

*Organizational climate for learning orientation* is the extent to which learning is encouraged and valued in the organization (Marquardt 1996). Organizational climate for learning is a critical component of organizational culture, which manifests itself in the overriding ideologies adopted by the organization and the established patterns of behaviour among actors in the organization (Schein 1992). Hence, organizational climate for learning drives the daily learning behaviours of individuals and groups, which in turn impact on overall organizational learning and adaptation, a process crucial to sustainable organizational success and survival in a turbulent environment. There have been calls by researchers for a learning culture that functions as a perpetual learning system (e.g., Schein 1992). Indeed, learning could only occur in organizations where it is strongly encouraged and highly valued.

*Knowledge acquisition and utilization orientation* represents the extent to which an organization is skilled in obtaining and assimilating the knowledge necessary for improvement and transformation in processes and structures, and for innovation (Choo 1998). Knowledge acquisition and knowledge utilization are two essential sub-processes of organizational learning (Marquardt 1996). Knowledge acquisition has a virtuous cyclical effect; it enhances an organization's knowledge repositories and thus facilitates organizational learning, and given that learning is cumulative in nature, it then facilitates

further learning (Nonaka & Takeuchi 1995). Knowledge utilization emphasizes that the knowledge acquired should be exploited to create new capabilities and innovations and embodied in the organization's routines, processes and mindsets (Wikstrom & Normann 1994).

*Information sharing and dissemination* orientation reflects the extent to which information is accessible within an organization (Hult & Ferrell 1997). Shukla (1997, p. 90) aptly highlighted the importance of this process in his assertion that "the capacity to disseminate is necessary for transferring learning to others in the organization, so that it becomes part of the collective and shared knowledge-base". Huber (1991) suggested that the process, by which information from different sources is shared, is a key determinant of both the occurrence and breadth of organizational learning. Without sharing and dissemination, knowledge often resides only in certain individuals or groups, a situation that can lead to loss of core competencies and competitiveness in the event of high or key personnel turnover (Schein 1992).

Each of the above four orientations presents a facet of organizational learning capability and they together reflect an organization's learning capacity, a broader and more encompassing concept. As learning is a complex process and its occurrence requires multiple inputs and conditions, the four orientations should be examined simultaneously when we approach the concept of organizational learning capacity.

Organizational learning capacity in SME shapes its executive's decision about information technology adoption. Specifically, strong systems orientation enables executives of SMEs to examine information technology from broad perspectives, instead of a pure technological perspective. Therefore, holistic knowledge about the benefits of the technology to their firms, which is very important for assimilating technologies critical for business operation and management, can be developed and executives will present more accurate attitude toward the technology. The attitude will in turn transform to managers' decision to adopt the technology.

SMEs with strong climate for learning will present widely-held consensus with respect to continuous individual and organizational improvement and competency-enhancement. Furthermore, aided by established mechanisms, individuals' knowledge acquisition will be realized. The accumulate knowledge at individual level may subsequently constitute parts of organizational knowledge in SMEs through information sharing and dissemination mechanisms. In the process of complex technology adoption top executives play determinant role for adoption decision; they nevertheless need the input from other members to make better decisions for the whole organizations. Therefore, information input from across hierarchical boundary facilitated by information sharing and dissemination mechanism will aid executives' decision regarding information adoption significantly.

In summary, the four orientations of organizational learning capacity work together to affect executives of small business in deciding to adopt new information technology. The major contribution of learning capacity is that it will facilitate knowledge enhancement, which will allow executives of small business to develop appropriate attitude toward the adoption of technology and show greater propensity to innovate their firms with new technology.

*H4: In the context of SME, organizational learning capacity is positively related to managers' attitude toward adopting complex technology in their organizations.*

*H5: In the context of SME, organizational learning capacity is positively related to managers' intention to adopt complex technology in their organizations.*

Figure 1 depicts our research model.

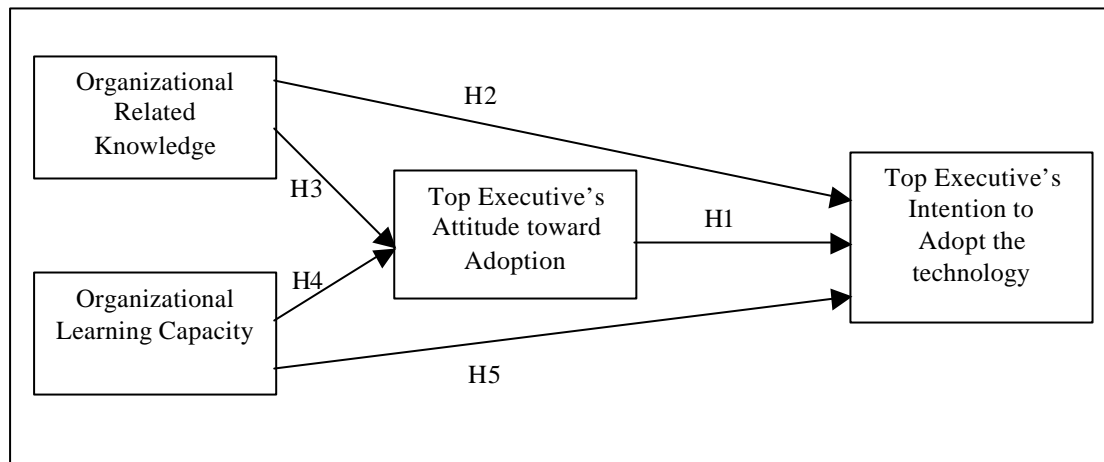


Figure 1. Research Model

## Methodology

### The Research Settings and Sample

A questionnaire survey was carried out in Hong Kong. In accordance with the study context, the sample chosen was 2000 small businesses with employees less than 100. The target respondents were top executives of their respective organization. 250 copies (response rate=13.6%) of the returned questionnaires were complete, and thus could be used for data analysis. The average size of the respondents was 67.12 (SD=25.5). To determine whether there is a potential for non-response bias, the first quartile was compared to the last quartile on a number of demographic characteristics to evaluate non-response bias (Armstrong & Overton, 1977). The test revealed no significant statistical differences between the early and late respondents with respect to their organization size ( $t = 1.84$ ,  $p = 0.176$ ), company history ( $t = 1.068$ ,  $p = 0.302$ ), and attitude toward innovations ( $t = 0.014$ ,  $p = 0.904$ ). This indicates that non-response bias is unlikely to significantly affect the analysis and interpretation of the findings.

The technology examined was an EDI (Electronic Data Interchange) system named ValuNet. Applying organizational learning and organizational knowledge perspective to EDI adoption research was based on the rationale that EDI is a complex innovation that imposes knowledge burden on adopting organization (McGowan & Madey, 1998), which fits Attewell's (1992) model that conceptualises the diffusion of complex technological innovations from an organizational learning perspective. ValuNet is designed to streamline the trade declaration process for importers and exporters in Hong Kong. Despite advertisement and promotion efforts, the status of adoption and usage was not satisfactory. Some of the target audiences have attributed their non-adoption to the lack of mental readiness and expressed their concerns with learning ValuNet. This reinforces the rationale with regard to applying organizational learning perspective to the study of EDI adoption in small businesses.

## Measures

The scale developed for measuring an organization's learning capacity in technology assimilation process (Teo et al 2001) was employed for the operationalization of the construct of organizational learning capacity. The scale treats organizational learning capacity as an encompassing second-order factor residing on four first-order factors. The analyses of validity and reliability of both organizational learning capacity itself and its four orientations demonstrates satisfactory psychometric properties. As the interpretation of organizational learning capacity in this study is completely identical to the conceptualisation on which the scale was based, we used it in our study. Measurement instruments for other constructs were generated specifically for this study. Past empirical research was extensively reviewed for instrument development. The created items were afterward distributed to academic experts with experience in organizational and information technology research for comment and review. Based on their comments, ambiguous sentences were reworded and inappropriate questions were discarded. Appendix lists all the questionnaire items.

## Comparison Models

As shown in Figure 1, the effects of organizational learning capacity and knowledge related to EDI technology involve both their direct effects on manager's intentions to adopt ValuNet and the indirect effects (Alwin & Hauser 1975) transmitted by managers' attitude toward ValuNet adoption. As similar research is lacking, we believe it is both theoretically and methodologically necessary to construct and test alternative models to examine and compare the interaction among organizational learning capacity, knowledge property and managers' attitudes in the process of making technology adoption decision.

Within the first model for comparison, we remove the construct of attitude. Organizational learning capacity and relevant knowledge exert their total effects (James & Brett 1984) directly on managers' technology adoption intention. The second comparison model tests the effect of attitude on managers' technology adoption intention by omitting the constructs of learning capacity and relevant knowledge. The two comparison models also test the hypotheses partially. Testing the comparison models can make it more explicit that whether using attitude as an intervening variable and integrating it with organizational learning capacity and knowledge related to EDI could produce a better explanation. If the explanatory power of the research model is superior to the comparison models, it can be deduced that the comparison models miss certain important effects coming from either attitude (COMA) or organizational learning capacity and knowledge base (COMB). The relationships among the constructs can be double-tested as well. Figure 2 depicts the two comparison models.

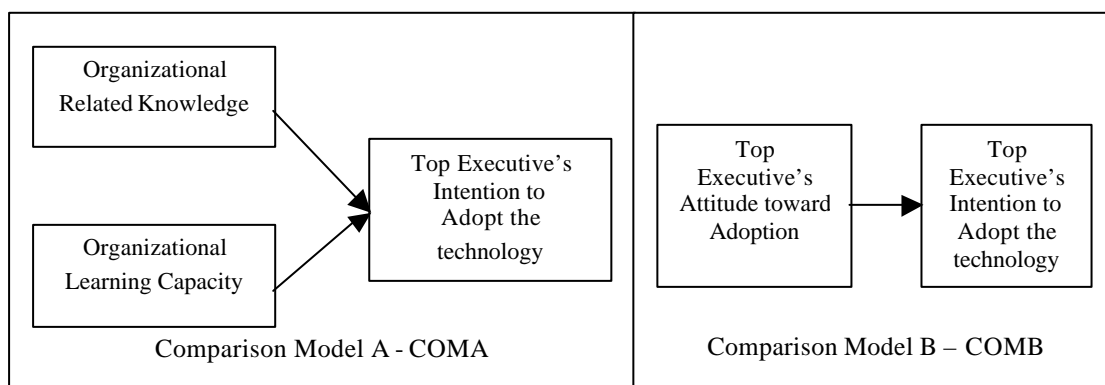


Figure 2: Two Comparison Models

Given that the study consisted of measurement model validating and structural model testing, structural equation modelling was employed (Hair et al 1998). An additional benefit of structural equation modelling is that it allows confirmatory factor analysis. Confirmatory factor analysis is suitable for this study because it permits researchers to design a model with second-order factor (Hair et al 1998), which was used in this study for the construct of organizational learning capacity.

PLS is appropriate for testing theories in the early stages of development. Given that this study is an early attempt to apply organizational learning theory to technological assimilation in small business context, PLS was selected.

## Results

### Results of Measurement Model

Convergent and discriminant validity were assessed to demonstrate the strength of the measurement model (Hair et al 1998). Results demonstrated that all the questions had reliability scores exceeding 0.707 (Table 1). Table 2 shows that all constructs demonstrated adequate composite reliability (threshold 0.7) and acceptable level of variance extracted (threshold 0.5). Thus, the scales possessed adequate convergent validity (Fornell & Larcker 1981).

Table 3 presents the correlation matrix of the constructs with the diagonals being the square root of the average variance extracted by each construct. In all cases, the correlations between a pair of construct were less than the diagonals, showing that the measures had discriminated adequately between the constructs

Questions	Standardized Loading	T-value
SYS	0.83	26.78
CFL	0.89	50.21
KAU	0.75	16.38
ISD	0.88	37.97
KIT1	0.82	29.79
KIT2	0.76	19.84
KIT3	0.91	51.27
KIT4	0.94	102.82
KIT5	0.93	90.63
KIT6	0.88	31.41
KIT7	0.90	39.55
ATT1	0.89	32.96
ATT2	0.94	88.92
ATT3	0.92	62.60

ATT4	0.91	44.92
INT1	0.92	53.18
INT2	0.73	11.20
INT3	0.93	92.69

*Table 1: Reliability of the Scales*

## Results of Structural Model

The use of PLS for data analysis tends to bias the results toward higher estimates for indicator loadings in the measurement model at the expense of lower estimates for path coefficients in the structural model (Chin 1998). This bias can be avoided by having a large sample size, at least 10 times the largest number of independent constructs affecting a dependent construct. Since the largest number of independent constructs affecting a dependent construct in the research model is 7, the sample size was large enough to overcome the bias.

With adequate measurement models, we proceeded to test the hypotheses by examining the structural models. The structural model was first evaluated with the explanatory power of the independent constructs. The research model yielded R-square of 0.25 for the final dependent construct and 0.19 for the mediating variable, both exceeding the threshold of 0.10 (Falk & Miller 1992). Thus the research model possessed adequate explanatory power, making further interpretation of path estimates meaningful.

Construct	Composite Reliability	Variance Extracted
OLC	0.90	0.71
KIT	0.95	0.77
Attitude	0.95	0.83
Intention	0.90	0.75

*Table 2: Reliability of and Variance Extracted by All Constructs*

Construct	OLC	KIT	Attitude	Intention
OLC	0.84			
KIT	0.42	0.88		
Attitude	0.39	0.32	0.91	
Intention	0.25	0.37	0.44	0.87

*Table 3: Discriminant Analysis*

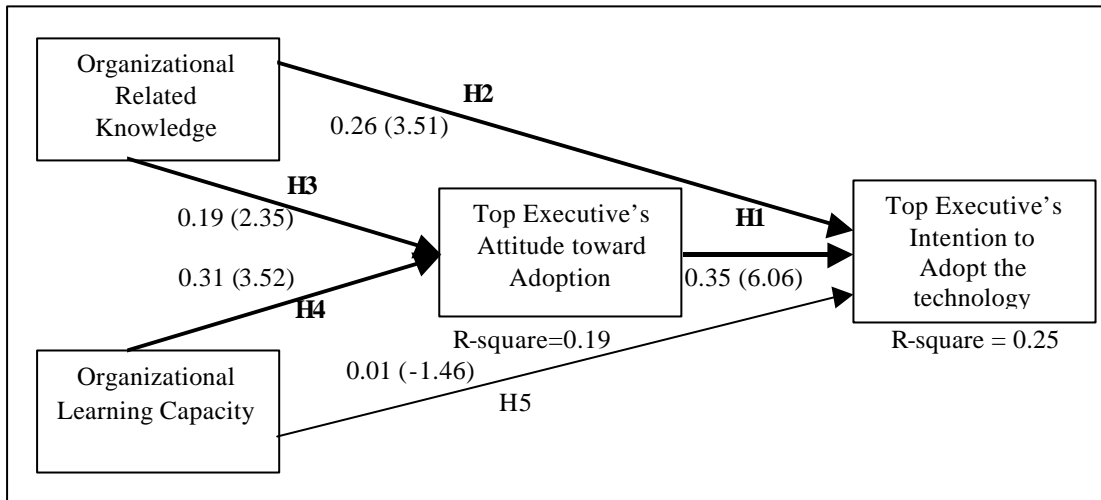


Figure 3. Results of Structural Model Analysis

Each hypothesis corresponded to a path in the structural model. Figure 3 depicts the estimates for research model with supported paths in bold ( $p < 0.01$ ).

Managers' intention to adopt ValuNet varied positively with their attitudes toward the adoption. Thus H1 was supported. Effects of attitude on intention consist of the mediated effects coming from organizational knowledge related to EDI and organizational learning capacity and that of attitude itself. Organizational knowledge related to EDI had both direct and indirect effect on small business managers' intention to adopt ValuNet in their firms. The indirect effect was transmitted by managers' attitudes towards adopting EDI. H2 and H3 were empirically supported. The effect of organizational learning capacity on intention to adopt ValuNet was completely mediated by attitude. H5 was not supported and H4 was supported.

## Results of Comparison Models

Although the structural model had supported the mediation effect of managerial attitude, analysis of the other two comparison models could provide more explicit evidence (Figure 4). COMA demonstrated the significant contribution of organizational knowledge to adoption intention but the effect of organizational learning capacity was absent. Additionally, the R-square was less than that of the research model. Thus COMA highlighted the value of the research model, which explicated the importance of attitude as a mediator and showed a complete picture of determinants of manager technological innovation decision process.

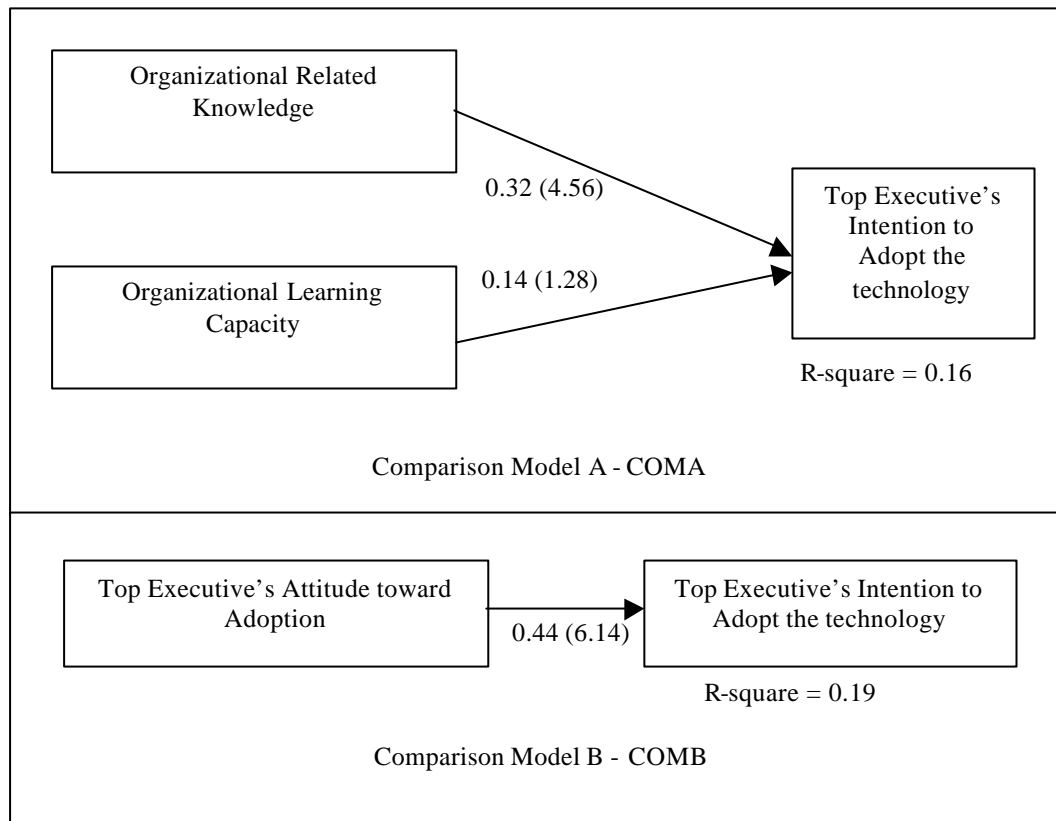


Figure 4: Path Estimates of Comparison Models

COMB demonstrated the significant effect of attitude alone on manager intention to adopt ValuNet. However, the explanatory power of the model was less than that of the research model, showing that it was inferior to the research model in discovering the possible causal antecedents of managerial intention.

## Discussion and Conclusion

This research applies organizational learning theory to small business technology adoption process. In view of the unique characteristics of small businesses, we focus the study on top executives decision making for their businesses. There are two important findings. First, an organization's learning capacity has indirect effect on the manager intention to adopt information technology through the mediation of the manager's attitude toward the adoption. Second, knowledge related to focal technology has both direct effect and indirect effect on manager intention to adopt the technology.

Our study rigorously validates the impact of the learning capacity in a small business on its innovation with information technology. The study of organizational learning in big organization tends to present learning capacity as an immediate predictor of an organization's innovation behaviour (Cohen & Liventhal 1990). If the finding were extended directly to the context of small business (COMA), misleading information about the role of learning capacity would be obtained. However, by introducing managerial attitude into the model of innovation adoption, this study confirms the effect of learning capacity in small business

context. As such, this study contributes to organizational learning study by expanding its applicability in a new domain.

Consistent with the findings about the effect of related knowledge on information technology adoption obtained from both large and small organizations (Teo 1998; Thong 1999), organizational knowledge base play significant role in innovation assimilation. It influences both managers' attitudes and intention toward information technology adoption.

The study has some implications for practice. Information technology providers and vendors could more effectively target the potential adopters among small businesses by examining their learning capacity and knowledge base. The instruments provided could be used to gauge the two factors.

Cautions should be given to future research that attempts to apply the findings. The research was conducted in Hong Kong. The cultural difference from other contexts such as South America warrants the necessity to replicate the study for generalizability purpose.

One potential limitation of the study is that it employs a strictly structured manner and presents only a rational normative view of information technology adoption in the context of small and medium-sized organizations. However, in reality, cognitive and institutional constrains often make organizational decision makers unable to follow a rational decision making processes. Specifically, organizational sociology posits that innovation adoption is a legitimacy-seeking process in which external institutional agencies will shape organizational decision-making (e.g., DiMaggio & Powell, 1983). Thus, we suggest additional attentions should be given to organizations' interactions with their external environment in applying the findings presented here.

Our study shows that the effect of organizational learning capacity on technology adoption is fully mediated by managerial attitude toward the technology. It is a potential research topic for large organization research to test whether the mediating effect of managerial attitude still exist. Additionally, Roger's seminal study of innovation diffusion suggests that technology adoption process is also affected by the characteristics of the focal technology (1995). Thus besides organizational knowledge base and learning capacity, the features of the EDI system could also impact managerial attitude and adoption intention toward the technology, which suggests a possible future study direction.

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## Appendix: Measurement Scales

### Systems Orientation

- SYS1 My staff have a good sense of my firm's business processes as a whole and the interconnectedness of all components of these processes
- SYS2 All activities that take place in business transaction processes are clearly defined
- SYS3 All parts of each business process are dependent to form a value chain

### Organizational Climate for Learning

- CFL1 We basically agree that our ability to learn is the key to improvement of our firm
- CFL2 It is my firm's policy to encourage the staff to have continuous education
- CFL3 The sense around here is that employee learning is an investment, not an expense
- CFL4 Learning in my firm is seen as a key to guarantee my firm's existence in this sector
- CFL5 I think it is necessary to attempt to develop new ways of looking at my firm's business processes regularly

### Knowledge Acquisition and Utilization

- KAU1 My firm regularly does research on the trend in technology pertinent to the way our business operates
- KAU2 My firm regularly assesses the potential influence of new technology on my firm's operations
- KAU3 My firm is susceptible to new technology and/or method to do business
- KAU4 My firm is quick to detect the change in the methods/technology employed by other firms in this sector

### Information Sharing and Dissemination

Pertaining to technological issues,

- ISD1 When a staff finds out something of importance to my firm, he/she is quick to alert others

- ISD2 It is my firm's policy that valuable insights or methods should be shared and used across the organization
- ISD3 There is a good deal of organizational conversation which keeps alive the lessons learnt from history
- ISD4 My firm's personnel turnover would not result in the loss of the firm's relevant know-how

#### **Organizational IT Knowledge Related to EDI**

My firm has the staff with experience to

- KIT1 develop complex application software for computerizing the business operation.
- KIT2 implement purchased application software.
- KIT3 implement EDI systems.
- KIT4 maintain EDI systems.
- KIT5 integrate EDI systems with daily operational application systems.
- KIT6 modify application software so that data can be transmitted directly between application systems and EDI systems.
- KIT7 directly update transaction databases with data from EDI systems.

#### **Executives' Attitude toward Organizational EDI Adoption**

- Att1 Overall I believe that my firm's adoption of EDI is good
- Att2 Overall I believe the effect of my firm's adoption of EDI is positive
- Att3 Overall I believe that my firm's adoption of EDI is helpful for business
- Att4 Overall I believe that my firm's adoption of EDI will provide the opportunity for the firm's improvement

#### **Executives' Intention toward Organizational EDI Adoption**

- INT1 My firm is seriously contemplating to adopt ValuNet.
- INT2 It is critical for my firm to adopt ValuNet.
- INT3 My firm is likely to adopt ValuNet.