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Determinants of E-Commerce Adoption in SMEs

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ABSTRACT

A deep insight of determinants of e-commerce adoption process is in needed to help small- and medium-sized enterprises (SMEs) to fasten up their e-commerce rush and overcome a great number of existed obstacles. This paper analyzed and classified factors taking effects on SMEs' e-commerce adoption into four groups, specifically: (1) perceived benefits, (2) organizational readiness, (3) external environment, and (4) leadership attitudes and competences. Especially, the paper also gets an overview on the role of leadership in motivating the uptake of e-commerce within SMEs. Thorough analysis within the research contributes not only a general view about core determinants of e-commerce adoption, but also the engine toward the success of e-commerce distribution channel in SMEs.

Keywords: E-commerce adoption, Determinants, Distribution channel, E-channel, and SME

1. INTRODUCTION

It has been observed and verified in many academic studies that SMEs have been actively looking for suitable solution and methods of adopting and integrating e-commerce into their business process. Based on different sense, researchers explored various factors that impact on SMEs in e-commerce adoption process. Focused on internationalizing SMEs, Tiessen (2001) suggested that SMEs' adoption e-commerce is driven both by market changes and by institutional norms. Following different approach, based on the Rogers (1995) model of innovation decision process, Kendall et al (2001) revealed that the compatibility issue is significant because it deals with their perception of the importance of e-commerce on their business now and in the future. Whereas, Levy and Powell (2001) demonstrated that the introduction of ICT into SMEs is fragmented and based on the operational support and transactions processing. Based on the discussion, they argued that a segmentation model, contingent on SMEs characteristics is applicable and may bring benefit for SMEs. Other existing researches indicated various factors appearing as enablers or limiters of e-commerce adoption in SMEs. Overall, they have been explored via interviews or surveys of SMEs implemented around the world (Poon and Swatman, 1999; Mehterns et al, 2001; Jeffcoate et al, 2002; Quayle, 2002; Lal, 2002; Olson and Boyer, 2003; Doherty et al, 2003; Drew, 2003; Pham, 2003). These previous researches showed a tendency for discussions about e-commerce to ignore the wider concerns involving distribution networks and hence the potentially crucial synergies.

Stemming from gaps in existing research, this study is aiming to answer the remaining question of "What are determinants of e-commerce adoption as novel distribution channel selection of SMEs?" During the

road, the study also portrays an in-depth insight in factors standing for the motivation leading a new e-channel design process distinguished from conventional ones, and consequently contribute a general view of an effective way to handle e-channel.

Section 2 of the paper is to discuss the whole picture of key factors affecting the e-commerce uptake process in a model of four components. Although some determinants composing these four components are widely recognized in the literature, the contribution of this paper is to synthesize the existing literature and adjust some factors including the role of government support, role of cultural factors, and the role of leadership attitudes into composing a conclusive model of determinants of e-commerce adoption. At the same time, the paper also suggests how to improve the insight of this important field in case of adopting e-commerce as a new digitalized distribution channel within SMEs.

The next part of the paper – section 3 – further discusses the important of considering these all components in a conclusive picture to accelerate SMEs to make a reasonable selection of electronic distribution channel.

2. DETERMINANTS OF E-CHANNEL ADOPTION AND E-CHANNEL DESIGN PROCESS

In general, enterprises may alter the most applicable model of e-commerce distribution channels based on three categories factors: (1) perceived benefits; (2) organizational readiness; and (3) influences external environment on the adoption decision process. However, for case of SMEs, the adoption of e-commerce model may depend on one more particular determinant – considered as the most important factor - the innovative attitude and knowledge about IT of the leadership. Figure 1 depicts determinants of SMEs'

e-commerce channel adoption motivation.

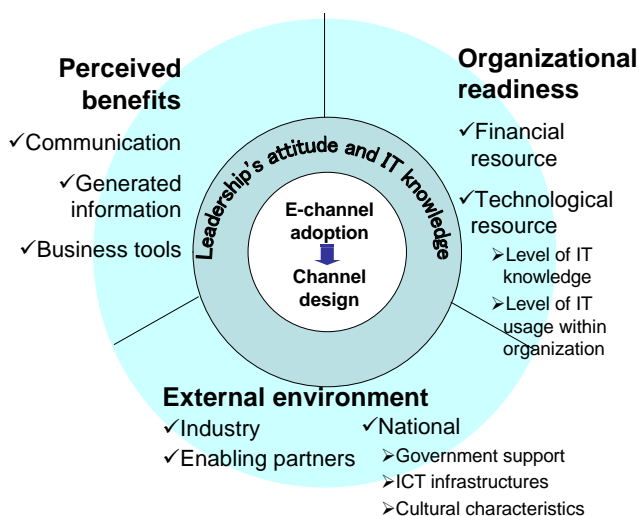


Figure 1

Factors impact distribution e-channel adoption

Source: Author's original work

2.1 Perceived benefits

The analytical results of Pham (2003) revealed that the more firms perceived the benefits they may gain from e-commerce implementation, the more firms are enthusiastic to engage e-commerce. In another words, as with many innovations, perceived benefits was often the characteristic that most influence its adoption and then affect their channel selection in fact.

From a theoretical point of view, and including the analysis of cases in which the e-commerce adoption has been successful, it is possible to identify a vast range of benefits that can be attained by SMEs companies via the e-commerce adoption. To get deep insight about the benefits that SMEs may gain from the so-called e-commerce, it is better to discover potential benefits into three groups, specifically: (1) communication, (2) generated information, and (3) business tools.

Enterprises experienced much of relative advantages from Internet as new methods of **communication** in comparison with to traditional ones, such as telephones and faxes. With the support of information technologies, firms will easy to smooth up the cooperation between customer and supplier, and then, lead to the elimination of many causes of conflict and mistakes, and at the same time, lead to a closer working relationship. This allows supplier to concentrate on composing the product to meet the customers' needs and at the same time, encouraging these customers to focus on fewer suppliers as well. As the results, SMEs are enabled to maintain the central order and administration systems, and consequently, consolidate individual orders to regional loads.

It is easily identifiable and realizable that information

and communication technologies contribute much on **generating information**. The ability of generating information basically rewards a saving in costs regarding to document management. ICT allows firms to avoid re-inputting the data into the computer, reconciliation of documents, expenses of sending the documents by postal mail or fax, and cost related to filing and storing document including the space devoted to this. Moreover, ability of generating information network over all global allows SMEs to stockholding at central warehouse, and then, give a promise of comparatively low stockholding level.

The Internet was also viewed as a **business tool** and should be used as an integral part of every business day to support business objectives. The ability of direct delivery and installation to customer from regional warehouse speeds up the local delivery system. Besides, the ability to saving costs in the management of documents, ability to improve the efficiency of the internal organization of the firm and change its relationship with customers, ability to achieve greater quantity of generated information are closely related to the usage of the so-called e-commerce; and then, stand for major motivation toward diffusing e-commerce within enterprises over all the world.

2.2 Organizational readiness

Many organizational level variables such as centralization, size, complexity, slack, formalization, integration, functional differentiation, and specialization have been studied within the context of innovation diffusion (Kimberly and Evanisko, 1981; Damanpour, 1987; Meyer and Goes, 1988). These variables are important variables capturing the organizational context in which strategic decisions are made. However, in respect of e-commerce adoption, this study is essential to capture organizational readiness under two dimensions: the level of (1) financial and (2) technological resources of the firm.

Financial readiness refers to financial resources available for ICT to pay for installation costs, implementation of any subsequent enhancements, and ongoing expenses during usage. Usually, small firms with available financial resources will be better equipped to implement e-commerce. Consequently, firms that can afford more costly, e-commerce projects are more likely to enjoy higher benefits from the use of such systems. SMEs with enough equipped financial resource are more enthusiasms to adopt e-commerce as a distribution channel.

The second dimension of organizational readiness – **technological readiness** – is concerned with the level of sophistication of information technology (IT) usage and IT management in an organization. It is common that different companies have different processing needs and different information and communication technology

(ICT) infrastructures. It can be expected that the likelihood of adopting new information technologies or using IT in new business activities depend on the IT dependency or intensity of a company. For instance, the more a business depends on computerized information processes, the more likely the company is to be interested in a new type of IT usage.

The evidence from the survey on Japanese SMEs (Pham, 2004) supported the idea that the Internet was adopted by organizations that have the personnel who understand well about the technology. The more people within a company equipped relevant knowledge of information technology, the speedier firm accelerate to engage e-commerce.

2.3 External environment factors

(a) Industry

It is commonly accepted that distinguished characteristics of each industry facilitate its participants to adopt innovation in all manners: technological innovations, product innovations, managerial innovations and so forth. Regarding impacts of industrial characteristics on innovation adoption decision of the involving firms, inter-industry competition, product characteristics, and customers' traits are considering as major accelerators.

Competition from firms frequently involves innovation and subsequently promotional activity. When the innovations involve new communication technologies, their adoption enhances the overall communications infrastructure which, in turn, facilitates information innovations, particularly of new communication technologies. In this way, market competition has the unexpected effect on accelerating the diffusion of this new communication technology, particularly in regarding usage of Internet as an alternative distribution channel.

Beside the competitive status within the industry considered as an engine of e-commerce adoption intention of SMEs, **product features** are also considering as another major source to accelerate the adoption e-commerce as a new distribution channel within enterprises in all sizes. Product features are firstly considered as company has an intention of joining new economy because there are a lot of product is quite fit with e-commerce and performing e-commerce may accelerate the market share of this product in the market such as music, movie, software, and so forth. However, other product, in contrast, is in low level of relationship with e-commerce activities such as health care and beauty service.

Customers are always the major considerations of firms in designing appropriate distribution channels. In the information age, tougher than ever, customer acceptance and behavior become factors determining the

transformation of enterprises' distribution channels. The fact is that, for such a paradigm shift to be accepted by customers, firms have to develop resources and competencies that add value for customers. Rapid growth of customer acceptance has been witnessed recently, especially for websites assuring security and privacy, building with familiar interfaces, and providing rich information with reasonable download time.

Another particular characteristic of industry that may act as a driver to e-commerce is the existence of strong **national retail networks** such as in Japan. An example is Seven-Eleven's '7dream.com' service in Japan, which allows customers to place orders online then pick them up and make payment at a local store. This indeed plays an important role to enable e-commerce in Japan as a complement to, rather than a substitute for traditional brick and mortar retail outlets.

(b) Partners

Pressures from trading partners are expected to be one of the most critical factors for e-commerce adoption by small firms; as the weaker partners in inter-organizational relationships, small business are extremely susceptible to impositions by their large partners. Such pressures are especially prevalent in the case of e-commerce because of its network nature.

A powerful partner may pursue three different strategies to induce small partner to adopt e-commerce in the relevant way. The first type is recommendation. Powerful partner use information to alter their smaller trading partners' general perceptions of how their organizations might more effectively operate via the use of e-transactions. In contrast, the other two strategies require compliance from the smaller firms. Promises include all tactics that suggest that the larger firm will provide the smaller partner with a specified reward if it becomes e-commerce capable. Threats, on the other hand, refer to actions that convey the larger firm's intentions to apply negative sanction should be the smaller company to become e-commerce capable. Such threats have been evidenced by large automobile manufacturers and department store chains in recent years.

(c) National environment

This part investigates some national characteristics considered as the most important determinants toward e-commerce diffusion of SMEs in various regions around the world. They include: (1) level of government support, (2) level of national ICT infrastructure, and (3) national culture.

Level of Government support

Governments should be a facilitator of business networks among SMEs and between small and large firms. The supports of government for accelerating e-commerce within SMEs are various including training and consultancy, offering state-of-the-art facilities for

events and business transactions, building up Internet homepages for SMEs and other means to improve access to information on business opportunities in foreign markets, helping SMEs participate in foreign exhibitions and trade fairs, prepare marketing materials in foreign languages and circulate advertisement abroad, and above all, the leadership role in accelerating the uptake of e-commerce by SMEs.

The support of the government is reflected, at first, in one of the most complex factors toward SMEs - the technologies associated with e-commerce. Security, electronic identifiers, authentication, digital signatures and passwords and the like are considered to be outside the domain of most SMEs. However, at the stage of adopting e-commerce into their businesses, SMEs needed to become "overnight" experts in the technologies associated with e-commerce. Then, greater co-ordination of training and education activities in IT areas, greater co-ordination of government initiatives in IT areas, and more focused provision of information in an effort to reach more SMEs may give the right incentives for SMEs to involve into e-society.

Level of national ICT infrastructure

Technological change creates new markets and business opportunities. EDI and other new Internet communication tools make cross-border networking easier and more practical for SMEs. They can reduce search costs for potential foreign business partners and improve a firm's visibility in global markets. They drive the internationalization of SMEs in various ways, owing to the growing ease of communications and the high costs of research and development. These tools allow firms in different locations can share know-how, information, distribution networks & other assets simultaneously. Rapid development of ICT has created a more favorable business environment for partnerships and encouraged growth in international strategic alliances. Increase use of ICT by national, regional and local geography, may create an incentive for SMEs to adopt e-commerce. In addition, it may provide a mechanism by which firms could reduce their administrative overheads.

However, the perceived barriers were pointed out in previous researches confirm that SMEs are facing specific problems in fully embracing the opportunities offered by ICT. With the distinguished standards of ICT, Japanese SMEs could not open their trading network toward new potential customers in other countries. Even that communication tools in Japan are powerful above all other advanced technology countries, Japanese SMEs could not diffuse this competitive advantage to more attractive markets overall the world.

Also, discussion in existing researches also figured out that in developing countries, lack of telephone lines, poor accessibility, limited and poor IT support services, poor quality of ISPs are key factors preventing SMEs

from uptake e-commerce as one competitive distribution channel.

Cultural differences

It is commonly agreed that culture encompasses values, beliefs, practices, and traditions that unify a group of people. Therefore, culture is expected to strongly influence one's attitudes toward e-commerce adoption.

At first, cultural factors take greatly effects on e-channel design regarding to the intention to set up a novel distribution e-channel. Also, the influence of culture on marketing has been observed and discussed in a great number of previous studies. For the countries who are conservative like Japan, culture may become one of the highest barriers blocking SMEs in trading domestic instead of internationalization.

Looking on another issue - select trading partners, firms have intention to be based the decision on various decision variables, which could include: partner characteristics; bid characteristics, and the like. Firms placed varying degrees of importance on these variables, depending upon the actual situation. However, standing as socio-economic entity instead of just a pure economic one, Vietnamese SMEs set up its partnership alliances based on individual relationships. Long term association between the parties also provides a sense of community and enhances social bonding. This plays an important role especially for e-commerce diffusion wave.

2.4 Role of SME's leadership toward the adoption of e-commerce

Standing as enterprises with few persons involving, SMEs are lay on the decision and behavior of the leadership in every manner, even this is concerning with financial, human resource, or a technological issue. Then, it is not surprising that for case of SMEs, the diffusion ability of technological innovation in general and Internet in particular lay on the behavior of the leadership in deed.

Openness to new ideas, freedom from investigation of operation, and risk-taking attitude may lead the leadership toward the adopting e-commerce and taking challenges coming with this new innovation. It is well observed evidences of SMEs' leaderships with innovative attitude accelerating their company to engage e-commerce. Lal (2002) indicated that the leadership of this type even taught themselves the know-how of web designs and built up commercial websites without any supports from a professional service provider. Whereas, risk-adverse attitude, incompetence in managerial and technical skills concerning with ICT may prevent the leadership of SMEs from uptake of e-commerce, generate the lack of confidence concerning e-transaction, and then lead them to the decision of not taking the new chance of engaging virtual markets.

3. IMPLICATIONS OF THE MODEL OF DISTRIBUTION E-COMMERCE CHANNEL ADOPTION WITHIN SMES

The above discussed factors frequently indicated in the literature are not impact SMEs' e-commerce adoption decision individually but integrated in a four component model. Interestingly, this model does not just process in term of e-commerce adoption decision only, but also analyze determinants of designing digitalized distribution e-channel as well. This model proposes that new distribution channel with the support of ICT results as an interaction among four components: the collectively perceived benefits, the organizational readiness, the considerations on external environments and attitudes of leaderships.

One important omission in all of the current literature is the lack of real in-depth analysis of the contribution of the external environment component to the e-business venture of SMEs. Most studies are concentrated on the internal factors and tried to point out the different in e-commerce performing of SMEs in different locations. The lack of understanding the role of external factors such as government support, existing of appropriated partners, or cultural characteristics would lead SMEs to be lack of confidence in implementing e-transactions and consequently, hesitate in making a decision of adopting e-commerce.

In fact, due to always in lack of capital and qualified human resources, SMEs needed some general platform to facilitate not only their ICT implementation but also their e-transaction and e-partner finding process that may be facilitated by regional and local governments. The model proposed within the paper (figure 1) suggests that the support of government in building up general ICT infrastructure, general electronic payment system, general distribution systems and the like is a key component in the innovation process for SMEs, in both advanced technology countries and developing countries as well.

The other striking point is that the significant of the leadership characteristics and competences is not get the right attention in literature reviewed to-date. Very little existing researches (Lal, 2002), whereas discussing the role of leadership, just bounded in indicating the effort of SMEs' leadership in getting familiar with new ICT-related know-how and knowledge.

The model proposed in figure 1 suggests that characteristics and competences of leadership is a key component in the e-commerce adoption process for case of SMEs. This means the complex interaction of other three components may not accelerate SMEs to engage e-commerce if leadership of SMEs is conservative and risk-adverse. These attitudes of the leaderships may lead SMEs not to recognize new prospectus generated by the digitalized global network.

However, the support of government or the participating in e-alliance solely does not able to accelerate SMEs to engage e-commerce. The integrate of external environment with all other factors such as organizational readiness, perceived benefit, and especially, the innovative attitude of entrepreneur will compose the powerful to accelerate SMEs in participating in virtual societies and answering the need of ongoing flexibility in the new digital age.

In short, the model demonstrated in figure 1 not just discovered critical factors separately but also reviewed them within comprehensive interactions. This enables us to better understand the nature and the importance of the individual contribution and interaction of the various model components. Studying these interactions would be considered as a starting point to identify how to select a right e-channel model for case of SMEs.

4. CONCLUSIONS

By exploring the literature, this work has identified a model of determinants of e-commerce channel adoption and performance with four major groups namely perceived benefits, organizational readiness, external environment, and attitudes of leadership. The analysis gave an overview of the engine bringing new business values SMEs need to compete, and to produce sustainable revenues in the years to come. The paper also contributes a new way to look at e-commerce innovation within SMEs and reflects a need to better perceive the detailed interaction of the four components of the model.

With the analytical framework composed within the paper, it is supposed that further studies may be taken to generate e-commerce scenarios applicable for case of SMEs. Further insights on each determinant may help to eliminate the tough barriers of supply-side gaps or demand-side gaps toward the uptake of e-commerce by SMEs and suggests the effective ways to gain much more benefit with help of e-commerce for case of SMEs. The framework may also be applied to further discover impacts of e-commerce on distribution channel performance and then to find out the mystery of success in adopting e-commerce as a domestic distribution channel vs. an international distribution channel.

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REFERENCES

- [1] Akaah, I.P., Korgaonkar, P.K., and Lund, D., "Direct marketing attitudes", *Journal of Business Research*, Vol. 34, No. 3, pp. 211-219, 1995
- [2] Damanpour, F., "The adoption of technological, administrative, and ancillary innovations: Impact of organizational factors", *Journal of Management*, Vol.13, No. 4, pp.675-688, 1987
- [3] Doherty, N., Ellis-Chadwick, F., and Hart, C., "An analysis of the factors affecting the adoption of the Internet in the UK retail sector", *Journal of Business Research*, Vol.56, No.11, pp.887-897, 2003
- [4] Drew, S., "Strategic uses of e-commerce by SMEs in the East of England", *European Management Journal*, Vol.21, No.1, pp.79-88, 2003
- [5] Grewal, D., Iyer, G.R., and Levy, M., "Internet retailing: enablers, limiters and market consequences", *Journal of Business Research*, Vol.57, No.7, pp.703-713, 2004
- [6] Gruber, H., "Competition and innovation: The diffusion of mobile telecommunications in Central and Eastern Europe", *Information Economics and Policy*, Vol.13, No.1, pp.19-34, 2001
- [7] Kendall, J.D., Tung, L.L., Chua, K.H., Ng, C.H.D., and Tan, S.M., "Receptivity of Singapore's SMEs to electronic commerce adoption", *The Journal of Strategic Information Systems*, Vol.10, No.3, pp.223-242, 2001
- [8] Kimberly, J.R., and Evanisko, M.J., "Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations", *Academy of Management Journal*, Vol.24, No.4, pp. 689-713, 1981
- [9] Lal, K., "E-business and manufacturing sector: a study of small and medium-sized enterprises in India", *Research Policy*, Vol. 31, pp.1199-1211, 2002
- [10] Levis, R. and Cockrill, A., "Going global – remaining local: the impact of e-commerce on small retail firms in Wales", *International Journal of Information Management*, Vol.22, pp.195-209, 2002
- [11] Levy, M. and Powell, P., "Information systems strategy for small and medium sized enterprises: an organizational perspective", *The Journal of Strategic Information Systems*, V. 9, No.1, pp.63-84, 2000
- [12] Mehrstens, J., Cragg, P.B., and Mills, A.M., "A model of Internet adoption by SMEs", *Information and Management*, Vol. 39, pp.165-176, 2001
- [13] Meyer, A.D., and Goes, J.B., "Organizational assimilation of innovations: A multilevel contextual analysis", *Academy of Management Journal*, Vol.31, No.4, pp.897-923, 1988
- [14] Olson, J.R., and Boyer, K.K., "Factors influencing the utilization of Internet purchasing in small organizations", *Journal of Operation Management*, Vol.21, pp.225-245, 2003
- [15] Pham, T.T.H., "E-commerce as a novel distribution channel for SMEs: An Exploratory of Japanese SMEs", <http://www2.igss.ynu.ac.jp/~d02lc902/document/NovelChannel.html>, 2003
- [16] Poon, S. and Swatman, P., "An exploratory study of small business Internet commerce issues", *Information and Management*, Vol.35, No.1, pp.9-18, 1999
- [17] Quayle, M., "E-commerce: the challenge for US SMEs in the twenty first century", *International Journal of Operation and Production Management*, Vol.22, No.10, pp.1148-1161, 2002
- [18] Tiessen, J.H., Wright, R.W., and Turner, I., "A model of e-commerce use by internationalizing SMEs", *Journal of International Management*, Vol.7, pp.211-233, 2001
- [19] Van den Poel, D. and Leunis, J., "Consumer Acceptance of the Internet as a Channel of Distribution", *Journal of Business Research*, Vol.45, No.3, pp. 249-256, 1999
- [20] Zheng, J., Caldwell, N., Harland, C., Powell, P., Woerndl, M., and Xu, S., "Small firms and e-business: cautiousness, contingency and cost-benefit", *Journal of Purchasing and Supply Management*, Vol.10, No.1, pp.27-39, 2004