

## The Adoption of E-commerce in SMEs in Vietnam: A Study of Users and Prospectors

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### Abstract

*The adoption of e-commerce by SMEs in Vietnam will enable these companies to do business in a much more efficient way. E-commerce will make these enterprises, as well as their products and services, better known, while at the same time making it possible for them to conduct transactions not only in that country, but throughout the world. The sample for this study consisted of 300 small and medium-sized enterprises in Vietnam. The results indicate that the size of the enterprise, its resources and its strategic orientation, the employees' knowledge of e-commerce, the attitudes of managers towards innovation and their knowledge of the new technologies and of e-commerce, the intensity of the competition, the degree of support of the government, the national infrastructure, the perceived relative advantages, and the complexity and compatibility of e-commerce all have an influence on the adoption of e-commerce in SMEs in Vietnam, but that this influence differs depending on whether it involves users or prospectors.*

**Keywords:** Adoption, e-commerce, innovation, SME, Vietnam

### 1. Introduction

SMEs are enterprises which play a very important role in the economy of many countries, and are essential components of the economy of Vietnam, a developing country. Managers of SMEs must be creative and autonomous, and strive to adapt to the evolving world economy. In order to succeed, it is essential that Vietnamese SMEs be open to new techniques, in particular the Internet and e-commerce, all of which have become indispensable business management tools. The new technologies are the key to enabling enterprises to establish contacts with enterprises throughout the world, in turn enabling them to participate in the world economy (Rayport and Jaworski 2003). Over the last few years, as part of the “Doi Moi” Reform, some Vietnamese enterprises have adopted e-commerce and are already benefiting from it. Many Vietnamese SMEs have been unable to resolve such problems by themselves, which is why government authorities, financial institutions and large enterprises have undertaken to support and encourage them with their policies and their assistance programs. With a few rare exceptions, Vietnamese enterprises, like most enterprises in developing countries, have not yet adopted much technological innovations, often because of a lack of resources, but also because of the work habits and culture of those who manage these SMEs. Many cannot, or will not, accept the risk inherent in changing the way they do business and their decision-making processes. In this study, we will analyze the differences in impact of internal and external

factors on the adoption of e-commerce in SMEs in Vietnam (from the perspective of users and of prospectors).

### ***1.1 Definition of SMEs in Vietnam***

The government provides a formal definition of SMEs in 2001 in Decree No.91/2001/CP-ND. According to this decree, SMEs “are independent business entities, which have registered their business in accordance with prevailing laws, with registered capital of not more than VND 10 billion or the annual average number of labor of not more than 300 people”. The decree encompasses enterprises registered under the Enterprise Law, State-owned Enterprise Law, cooperatives registered under the Cooperative Laws and household businesses if they meet these requirements.

### ***1.2 E-commerce in Vietnam***

E-commerce is now at its initial stage in Vietnam, Vietnamese enterprises are improving their awareness of importance and effectiveness of application of information technology and e-commerce to their business. Several enterprises have established their own websites to introduce products and services to customers and clients as well as to implement online sale and purchase (B2C) or built up websites to gather many enterprises to introduce products and services (B2B). A large number of e-commerce websites have made their debut in Vietnam for the past two years and shown their effectiveness such as GoodsOnlines, VDC Supermarket, VnEmart, VietOffer, WorldTradeB2B, etc. Owners of these websites can be sectoral associations, trade offices, governmental agencies, or even companies or individuals. Their presence is a good signal for development of e-commerce in Vietnam. However, due to low development of infrastructure as well as of policies, legal environment, intellectual property protection, privacy rights, etc, enterprises and consumers have not been eager and confident enough to participate e-commerce. Under Vietnam's Overall Plan on Developing E-commerce in the 2006-2010 approved by the government last year, by 2010, some 60 percent of large enterprises will conduct B2B e-commerce, 80 percent of small and medium firms B2C or B2B, and about 10 percent of households B2C or C2C.

## **2. Literature review**

SMEs are interested in e-commerce because it can help them improve their business processes, reduce costs and achieve a closer relationship with their clients. Beyond this, the adoption of e-commerce in SMEs has become a necessity in a context of the globalization of markets. E-commerce emerges in industry in three forms (Rayport and Jaworski 2003): inter-enterprise (business-to-business (B2B)), between enterprises and consumers (business-to-consumer (B2C)) and inter-consumer (consumer-to-consumer (C2C)). Most theories of the adoption of e-commerce have been developed on the basis of the adoption models of the information technologies (IT) and information systems (IS). For this study, we have constructed a synthesis of the principal factors defined in theoretical and empirical studies on the process of technology adoption, and have grouped them into two categories:

- Models of adoption of information technologies and of information systems (Chieochan et al. 2000; Karahanna et al. 1999; Premkumar and Roberts 1999; Thong 1999; Lefebvre and Lefebvre 1996; Grover and Goslar 1993)

- Models of adoption of the Internet and of e-commerce (Seyal and Rahman 2003; Lertwongsatien and Wongpinunwatana 2003; Rashid and Al-Qirim 2001; Ling 2001; Premkumar and Robert 1999).

According to these studies, the success of the innovation adoption step in organizations rests on the following considerations: the role of managers in the adoption process in enterprises (the more positive the perception of managers towards new technologies, the more quickly the innovation is adopted), the industrial environment (sources of information, infrastructure, and pressure from suppliers and buyers can accelerate the adoption process) and internal resources (financial and technical resources are the principal facilitators during implementation).

### **3. Conceptual framework**

#### **3.1 Adoption of e-commerce**

E-commerce is defined as the purchase and sale of products and services by electronic means such as Internet, e-mail and exchange of electronic data. E-commerce forms an important component of “electronic activities”, a broader term which refers to the automation of any commercial process by electronic means (Rayport and Jaworski 2003). The adoption of e-commerce is a reflection of the strategic orientation of an enterprise, and can be characterized by the extent of interactions such as exchanges of information, communication, distribution, transactions and/or collaboration) in the business process. An enterprise can be using e-commerce currently, or plan to use it in the future (Thong 1999; Teo and Tan 1998). The extent of adoption of e-commerce can be measured by whether or not the enterprise currently uses or will soon use at least one form of the technology associated with an electronic network (for example, the exchange of computerized data (EDI: Electronic Data Interchange), the Internet, Intranet and Extranet, etc.), and by whether or not it currently uses or will use such interconnectivity for business interactions. The extent of adoption of each electronic network can be measured according to the criteria proposed by Lertwongsatien and Wongpinunwatana (2003), Limthongchai and Speece (2003) and, taking into account the current context in Vietnam, we can classify the adopters of e-commerce in SMEs in Vietnam in three categories:

- Users (or first adopters): currently use a form of e-commerce technology
- Declared prospectors: plan to use it within three years
- Declared late-comers: plan to use it in more than three years time, or not use it at all.

#### **3.2 Internal and external factors in the model of adoption of e-commerce in SMEs**

##### ***3.2.1 Organizational characteristics***

- Size of enterprise (H1): The size of the enterprise is a determining variable in the adoption decision. According to Ling (2001), Teo and Tan (1998), the small size of an enterprise is an important factor hindering adoption of the Internet technology by enterprises. Small enterprises are less apt to adopt e-commerce because they often lack resources, a situation brought about by such factors as operating in a strongly competitive environment, major financial constraints, lack of professional expertise and greater sensitivity to external forces (Thong 1999; Thong and Yap 1995).

- Type of business of the enterprise (H2): Teo and Tan (1998) studied the relationship between the various types of business (governmental, local or foreign organization; characteristics of products, number of product categories, etc.) and the adoption of the Internet. According to these authors, this variable, as well as the enterprise's types of activities, have an influence on the adoption of e-commerce.
- Strategic orientation of the enterprise (H3): The strategic orientation of the enterprise has been cited by Auger et al. (2003), Lefebvre and Lefebvre (1996) as an organizational factor that influences the adoption of e-commerce. The strategic orientation variables retained by these authors are risk analysis and the capacity to accept risk. According to them, the strategic orientation helps speed up the adoption process.
- Employees' knowledge of e-commerce (H4): Adapting to new technologies may require changes in the work attitudes of the employees, as well as their qualifications, their level of performance and the extent of their knowledge of e-commerce technology. Teo and Tan (1998) have stated that one of the main reasons for not adopting the Internet is lack of internal expertise. Many organizations have attempted to delay the adoption of an innovation or new technology until they had acquired sufficient internal expertise (Thong 1999). If the employees already know about e-commerce, then the organization may be more disposed to adopt e-commerce.
- Culture of enterprise (H5): According to Ling (2001), Chieochan et al. (2000), the culture of the enterprise has an influence on the adoption of information technology and e-commerce. The organizational culture can be measured by the flexibility of decision-making, the concentration of authority, and the capacity to change the strategic plan. Le and Jolibert (2001) studied these variables in the context of SMEs in Vietnam.
- Resources of enterprise (H6): In an enterprise, the financial, human and technology resources (computers, telephone lines, cable, etc.) play a very important role in the adoption of new technologies (Rashid and Al-Qirim 2001; Thong 1999; Thong and Yap 1995). In the case of SMEs in particular, even if the managers perceive the adoption of new technologies and e-commerce as important, the enterprises often do not have sufficient resources to adopt them.

### ***3.2.2 Characteristics of managers***

- Attitudes of managers towards innovation (H7): Seyal and Rahman (2003), Rashid and Al-Qirim (2001), Chieochan et al. (2000), Thong (1999) and Thong and Yap (1995) have all stressed the importance of the role and attitudes of managers towards innovation in the adoption of the information technologies and the spread of Internet use.
- Knowledge of the new information technologies and of e-commerce (H8): The knowledge of the information technologies possessed by managers has an effect on the adoption of e-commerce (Thong and Yap, 1995), and their knowledge of the new technologies and of e-commerce also has a positive influence on the degree of use of e-commerce (Rashid and Al-Qirim 2001; Chieochan et al. 2000).

### ***3.2.3 Environmental characteristics***

- Intensity of competition (H9): A number of authors have studied the possible influence of the intensity of competition on the adoption of new technologies or of e-commerce (Iacovou et al. 1995). By contrast, Thong (1999) has found that competition influences the adoption of new technologies or e-commerce very little in small enterprises, while Premkumar and Roberts (1999) have stated the opposite, that the pressure of competition is a factor that influences adoption. Finally, Lertwongsatien and Wongpinunwatana (2003) have found that there is a relationship between the intensity of competition in an industry and the degree of adoption of e-commerce.
- Pressure of suppliers and buyers (H10): Ling (2001), Rasid and Al-Qirim (2001) have addressed the relationship between the pressure of suppliers, and that of buyers, on the enterprise and the adoption of e-commerce. It seems that this influence depends on the characteristics of the suppliers and buyers, such as geographical distance, habits, tradition and purchase behavior.
- Support of large enterprises (H11): This is a new factor in the model of adoption of e-commerce in the context of international business activities which we are proposing. Large enterprises cannot conduct their business in all markets and must therefore find SMEs with which to establish partnerships, and SMEs can become satellites of large enterprises. By the same token, large enterprises can help SMEs adopt new technologies and e-commerce, thanks to their experience and their infrastructure.
- Support of government (H12): Many authors have studied the influence of government support on the adoption of new technologies and e-commerce in enterprises (Ling 2001; Rashid and Qirim 2001; Tan and Teo 2000; Lefebvre and Lefebvre 1996). According to these authors, government entities can be among the most powerful institutional forces affecting innovation. The policies of governments that increase, or seem to increase, a company's capacity to compete in the market place have a strong positive influence on the strategies of development of technologies in enterprises.
- National infrastructure (H13): The infrastructure of a country positively influences the adoption of new technologies (Ling 2001; Chieochan et al. 2000). In countries with good technological support and a sound infrastructure, adoption is more marked (Tan and Teo 2000).

### ***3.2.4 Characteristics of innovation***

- Perceived relative advantages (H14): Perceived relative advantages are related to the degree to which potential adopters perceive the innovation to be preferable to existing conditions. Relative advantages were addressed by Limthongchai and Speece (2003), Seyal and Rahman (2003) and Kendall et al. (2001). The positive perception of the advantages of e-commerce should provide an incentive to adopt e-commerce. Generally, a positive relationship exists between advantages and the relative adoption behaviors.
- Complexity of the innovation (H15): Complexity refers to the degree to which an innovation is perceived as being difficult to use. The technical know-how required for e-commerce can prevent its adoption. One would expect that a high degree of perceived complexity of e-commerce would negatively influence the decision to adopt it (Seyal and Rahman 2003; Grover and Goslar 1993).

- Compatibility of the innovation (H16): Compatibility is the degree to which an innovation is perceived to be in keeping with previous experience and existing values, and with the needs of possible adopters (Grover and Goslar 1993; Teo and Tan 1998). Enterprises choose forms of e-commerce which conform to certain internal values and experience or which enables them to reduce the perceived risks and to make minimal adjustments and changes, in turn leading to less resistance to adoption. Conversely, we find that the incompatibility of a new e-commerce system with existing work procedures, value systems and infrastructure negatively affects the attitudes of users and increases their resistance to change, in turn hindering the adoption of e-commerce (Grover and Goslar 1993; Teo and Tan 1998).

**Hypothesis:** Internal and external factors in the model of adoption of e-commerce (from H1 to H16) in SMEs differs depending on whether it involves users or prospectors.

#### 4. Research methodology

Data were collected through a questionnaire and we were careful to ensure that the questionnaire was complete and that it allowed us to achieve our research objectives, while at the same time being concise. The questionnaire was originally written in English, and then translated into Vietnamese. The methodology called for eight interviews with SME managers to validate the variables retained. A pretest was conducted among twelve Vietnamese SMEs: four in Ho Chi Minh, four in Danang and four in Hanoi. A few modifications were made to the questionnaire following the pre-test. The random sample was composed of 300 respondents: 100 SMEs in HoChiMinh (in South Vietnam), 100 SMEs in Danang (in Central Vietnam) 100 SMEs in Hanoi (in North Vietnam). The names of the enterprises were drawn from a list of SMEs compiled by the Chamber of Commerce and Industry of Vietnam. Data collection was performed in two stages. A proposal letter and the questionnaire were sent out by the Chamber of Commerce and Industry of Vietnam, specifying an appointment (date and time) for collection of the questionnaire two weeks later. The researcher visited each enterprise at the specified date and time, and collected the respondent's questionnaire. With this method of data collection, a high rate of response (71%) was obtained, yielding 214 completed questionnaires. Moreover, because we were in contact with the respondents, it was possible to correct the questionnaires if errors were detected in the responses or if there were inconsistencies in the answers. Once the data collection completed, the accuracy of the measurements was verified using the Cronbach alpha coefficient. According to Hair et al. (1998), values above 0.7 are acceptable. As a result of this process, the variable FOAC (pressure of suppliers and buyers) = 0.5408) was eliminated, and, consequently, hypothesis H10a was abandoned. Subsequently, we verified the validity of the data. Principal components factorial analyses, with a varimax rotation, were performed in order to analyze the quality of the measurements from a number of angles. Factorial analyses revealed that the values of the factorial dimensions were equal to or above 0.50 in all cases, except for a statement on the culture of the enterprise, which was eliminated.

#### 5. Sample profiles

Three times as many men responded to the questionnaire as women. The mean age of respondents is 41.62 years, and the mean length of service in the company is 9.16 years.

Most of the respondents hold a Bachelor's degree or vocational college diploma. Some managers and employees even hold a Master's degree. Nevertheless, 28.0% of respondents (60 individuals) have not completed a vocational college-level diploma (or "Cao dang va Trung hoc chuyen nghiep", the equivalent in Vietnam). These individuals usually have sound professional knowledge in general, and knowledge of the Internet in particular. They may have been opinion leaders, and as such the first to adopt and use e-commerce in their enterprise. The service enterprises (87) and construction enterprises (44) represent 61% of respondents. The characteristics of each category are defined as follows: users (53 enterprises (24.8%)) are enterprises which currently use e-commerce in their enterprise; prospectors (71 enterprises (33.2%)) are enterprises which do not currently use e-commerce, but intend to adopt it and expect to use it within the next three years; late-comers (90 enterprises) are enterprises which do not expect to use e-commerce or who expect to use it three years or more from now.

## 6. Tests of hypothesis

Prior to performing a discriminant analysis of the impact of independent variables on the adoption of e-commerce in enterprises according to the category of adoption (users and prospectors), the mean values of the independent variables were analyzed. In general, these values are higher for users than those for prospectors, and are particularly high for users in the case of strategic orientation (ORIE = 5.019), resources of the enterprise (RES = 5.576), attitudes of managers towards innovation (INNO = 5.576), knowledge of new technologies and of e-commerce of managers (KNOM = 6.019), support of government (GOV = 5.462) and national infrastructure (INFR = 5.285). For prospectors, these values are respectively 4.394, 5.014, 4.754, 5.394, 4.880 and 4.783.

In our study, the adoption of e-commerce by the two categories retained (users and prospectors) was analyzed based on fifteen independent variables. The results of the discriminant analysis for the two groups studied are presented in Table 1. Since  $1 - \lambda = 1 - 0.408 = 0.592 > 0.5$ , we can say that it is possible, with the independent variables making up this function, to clearly discriminate between the two categories. Furthermore, since the value of Chi squared ( $\chi^2$ ) is 102.5 and the level of significance is equal to 0.000, we can state that the model, which also has a high level of significance, clearly explains the statistically significant differences between users and prospectors with respect to the adoption of e-commerce in SMEs in Vietnam.

In order to confirm or invalidate the hypothesis that the impact of independent variables on the adoption of e-commerce in SMEs in Vietnam differs depending on whether it involves users or prospectors, the equality of means test was performed using a discriminant analysis. The probabilities of the Fisher statistic identify independent variables that have a discriminant significance between the two categories (Hair et al. 1998). The results in Table 1 support hypotheses H1, H3, H4, H6, H7, H8, H9, H11, H12, H13, H14, H15 and H16. We can therefore say that these variables impact significantly the adoption of e-commerce in SMEs in Vietnam differ, and that the majority of variables explaining the categorization of respondents between users and prospectors are statistically different.

**Table: Equality of means test of independent variables between users and prospectors**

Hypothesis	Variables <sup>(1)</sup>	Lambda ( $\lambda$ ) of Wilk	F	Sig. <sup>(2)</sup>	Function coefficient
H1	Size of enterprise	0.776	35.25	0.000 ***	0.447
H2	Type of business	0.970	3.791	0.054 ns	0.146
H3	Strategic orientation	0.934	8.598	0.004 **	0.221
H4	Knowledge of employees	0.938	8.109	0.005 **	0.214
H5	Culture of enterprise	0.995	0.635	0.427 ns	0.060
H6	Resources of enterprise	0.938	8.064	0.005 **	0.214
H7	Attitudes of managers	0.857	20.30	0.000 ***	0.339
H8	Knowledge of managers	0.927	9.630	0.002 **	0.233
H9	Intensity of competition	0.948	6.644	0.011 *	0.194
H11	Support of large enterprises	0.990	0.002	0.962 ns	0.004
H12	Support of government	0.926	9.747	0.002 **	0.235
H13	National infrastructure	0.963	4.674	0.033 *	0.163
H14	Perceived relative advantages	0.896	14.17	0.000 ***	0.283
H15	Complexity of innovation	0.897	14.00	0.000 ***	-0.282
H16	Compatibility of innovation	0.670	60.20	0.000 ***	0.584

<sup>(1)</sup> Hypothesis H10a (Pressure of suppliers and buyers) was abandoned because of the weak validity of the variables.

<sup>(2)</sup> Fisher significance: (\*):  $P < 0.05$ ; (\*\*):  $P < 0.01$ ; (\*\*\*):  $P < 0.001$ ; (n.s): non significant

## 7. Discussion and conclusion

The objective of this study was to understand the impact of various internal and external factors on the adoption of e-commerce in SMEs in Vietnam. The results of the analysis clearly show that users differ significantly from prospectors with respect to a number of variables (size, strategic orientation and resources enterprise, employees' knowledge of e-commerce, attitudes of managers towards innovation and their knowledge of new technologies and e-commerce, intensity of competition, support of government and national infrastructure, perceived relative advantages, complexity and compatibility of innovation). On the one hand, the results of our study are generally similar to those of Lertwongsatien and Wongpinunwatana (2003) in terms of the size of the enterprise; on the other hand, in terms of the variables of perceived relative advantages, complexity and compatibility of innovation, our results differ from those of researchers who found that there were no significant differences between users and prospectors.

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ASEM TFAP E-commerce:

[http://www.asemec.org/partners/partners\\_overview.asp?zId=1&pFlag=Overview&cNo=12&cType=0&nId=0&cName=VIETNAM&cId=25](http://www.asemec.org/partners/partners_overview.asp?zId=1&pFlag=Overview&cNo=12&cType=0&nId=0&cName=VIETNAM&cId=25).