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College of Informatics

Graduate School of Information Management

Master

Factors Affecting Acceptance of SMEs' Employees in the
Adoption of E-commerce in Vietnam

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February, 2011

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Dr. Nguyen Linh Trung

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Factors Affecting Acceptance of SMEs' Employees in the
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Abstract

In highly competitive environment nowadays, E-commerce can be considered as an important source of competitive advantage for most of enterprises, especially small and medium enterprises (SMEs). Before, the researches focused mainly on the adoption of E-commerce in developed countries. However, today, with the steady development of economy, developing countries (including Vietnam) have gained more and more attentions of researchers. Thus, the studies in this field are rising.

The concept "E-commerce" appeared when business organizations began to realize the important role of Internet as a means for conducting business. According to Chaudhury & Kuiboer (2002), E-commerce has been significantly contributed in reducing in costs of doing business, improving product/service quality, attracting new customers and suppliers, and developing new ways for product distribution. It brings benefits not only to large enterprises but also SMEs.

Over the last few years, after Vietnam implemented Reform (Doi Moi) policy and

opened its market, a number of Vietnamese SMEs have implemented and gained benefits from it.

The purpose of this study is to examine and to understand more clearly the influence of relevant factors on the acceptance of SMEs' employees, who directly use E-commerce in their enterprises. A research framework was developed and seven hypotheses were formulated to test the relationships. Developing and testing hypotheses by using survey data from 340 employees of SMEs in Nam Dinh province, in Viet Nam. This research employed SPSS 13.0 to analyze the collected data to test the relationships among factors and all items require five-point Likert-scale.

Support was found for all of the seven hypotheses formulated. The results indicate the positive relationships among Information quality, System quality, Intention to Use, User Satisfaction and E-commerce Adoption.

Keywords: E-commerce, IS Success Model, D&M IS success mode, Information Quality, System Quality, Intention to Use, Satisfaction of User, E-commerce adoption, SMEs

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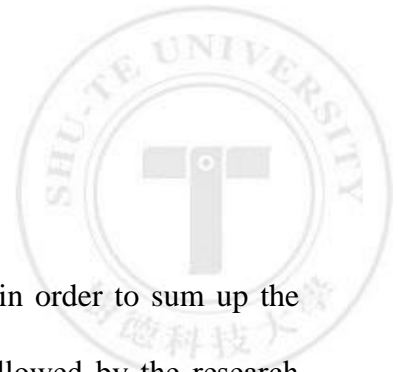
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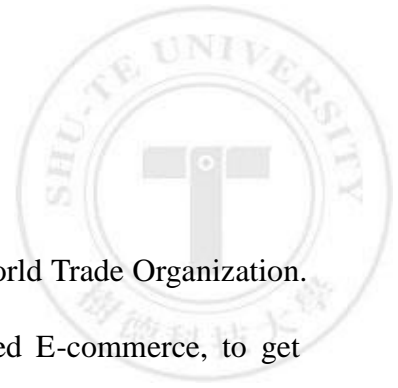


Chapter 1 Introduction

This paper will start by examining research background in order to sum up the investigated topic for the readers compendiously. It's then followed by the research motive and research purpose, which will end with an overall purpose of the study. Lastly, the scope of the research, structure of the research and limitations will be formulated from the problem discussion.

1.1. Research background

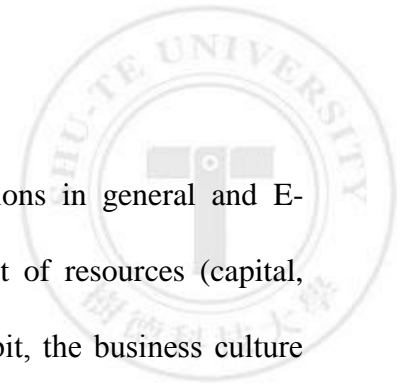
The sector of small and medium-sized enterprises (SMEs) is an important factor in most economies, especially in developing countries, and creates more than 90% of the businesses in some countries (OECD, 1998). In Vietnam, according to the website *vfr.vn*: “the number of SMEs in Vietnam accounts for 97 percent of Vietnamese enterprises (calculated on annual labor) or some 85 percent (calculated on capital), given by the latest statistical data of Vietnam General Office of Statistic”. Due to the significance of SMEs, our government needs to design and issue policies to encourage their development. Simultaneously, SMEs themselves must be more dynamic, active as well as try to adapt to and catch up with the global economic environment. To achieve that goal, Vietnamese SMEs should invest on new and modern machines as well as equipments, in particular computer science-based techniques, Internet and E-commerce, which are very necessary for business management nowadays. These new technologies allow businesses to have access and contact with other enterprises around the world, as a result make their participation in the world economy possible (Rayport,



J. F. & Jaworski, B. J., 2003).

In 2006, Vietnam became the 150th official member of World Trade Organization. That enables Vietnamese enterprises, which have implemented E-commerce, to get benefit from it. Nevertheless, in fact, the implementation of E-commerce in SMEs in Vietnam is very difficult. According to the Deputy Trade Minister Le Danh Vinh, “although the opportunity of developing E-commerce in Vietnam is very optimistic, there are also many challenges such as the lack of human resources for E-commerce, an under developed ICT infrastructure and particularly the unformed legal environment and policies”. In practice, “most enterprises only hear of E-commerce but do not know about its benefits and the conditions for joining - commerce. Indeed, the E-commerce concept is still strange to the majority of the public. Very few enterprise leaders and management officials have any basic knowledge of E-commerce and human resources for applying, exchanging and developing and the business skills of E-commerce (Kim Phuong, 2010).

In Vietnam, many small and medium-sized enterprises begin to recognize the important role of E-commerce to business activities but they don't know how to deploy E-commerce applications consistently (www.moit.gov.vn). SMEs try to implement the application of the Internet and E-commerce in business activities in order to increase their competitive advantage in the marketplace. Many businesses recognize the benefits of E-commerce and want to apply E-commerce to marketing and business popularization (www.moit.gov.vn). However, most of Vietnamese



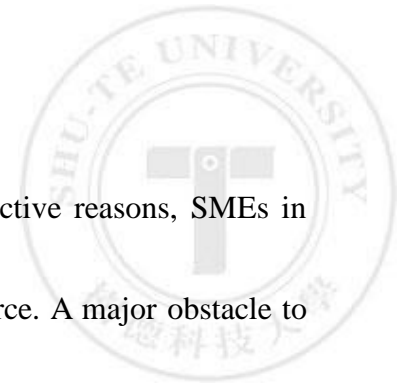
enterprises have not yet implemented technological innovations in general and E-commerce in particular. The major reasons may be the limit of resources (capital, technologies, high-quality human resources ...), the work habit, the business culture and the protection of nation.

1.2. Research motive

Benefits of E-commerce are well documented as the following:

- It enables enterprises (even small enterprises) to access the global market for selling and purchasing products and services. There is no time limit because transactions happen 24 hours a day and even on holidays and weekends. As a result, the sales and profit increase significantly (*www.moit.gov.vn*).
- It can cut down the costs related to marketing, customer care, processing, information storage and inventory management. It increases productivity and enables efficient customer care services. Moreover, it collects and manages information related to customer behavior, which in turn helps to develop and adopt an efficient marketing and promotional strategy.
- E-commerce gives the customers the chance to buy cheaper and quality products. Sometimes they can even find out the original manufacturer to purchase a product at a much cheaper price than that charged by the wholesaler. This shopping form is usually more convenient and time saving than conventional shopping.

Major obstacles in E-commerce development

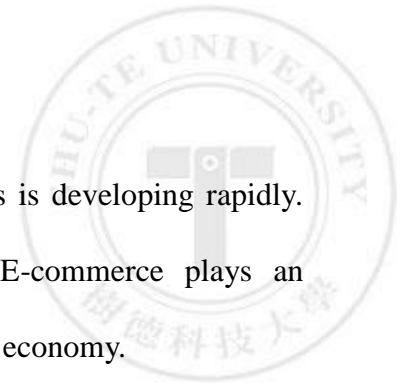


However, because of many subjective as well as objective reasons, SMEs in Vietnam haven't actually make use of the power of E-commerce. A major obstacle to E-commerce is the lack of information and official guidance from government on what is allowed and not allowed. There is also a shortage of funds and expertise to investigate E-commerce. The E-commerce application in some Vietnamese enterprises just comes to a halt in advertising. Meanwhile, the application in advertising is only an extremely small advantage of E-commerce, according to *Vietnam E-commerce Report 2007* (by Vietnam E-commerce and IT Agency, under Vietnam Ministry Industry and Trade).

Due to the small number of full E-commerce development in Vietnam, previous research on development and deployment issues is scarce. Therefore, one important objective of this research is to find empiric data on businesses' perception of what would be the major E-commerce deployment issues.

1.3. The importance of E-commerce

Electronic commerce has become a new trend and help businesses to integrate with the world's economy. Some reports such as *Vietnam E-commerce Report 2007* (by Vietnam E-commerce and IT Agency, under Vietnam Ministry Industry and Trade), *legal framework and E-commerce country Report: Vietnam* (by Tran Ba Thai), etc.



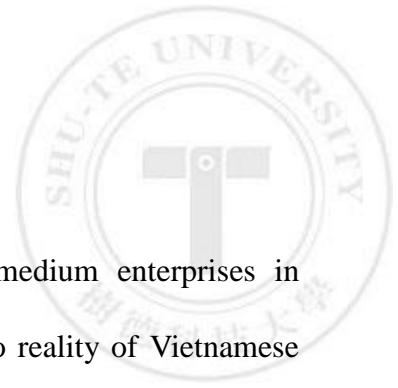
have indicated that the E-commerce application in enterprises is developing rapidly. Therefore, the increasingly successful implementation of E-commerce plays an important role in helping businesses to integrate into the global economy.

With the importance of E-commerce and the enterprises' activeness, the E-commerce in Vietnam is developing and expanding in depth, in width and lays the foundation of the all-round development in the coming years.

Vietnamese enterprises, especially SMEs, which account for large proportion in total Vietnamese enterprises, initially recognize the benefits and the importance of E-commerce application. In recent years, investment structure indicated that enterprises have started to focus on investment to implement E-commerce after stabilizing the information technology infrastructure. A lot of businesses have cared for arranging their staff that is in charge of E-commerce. More and more enterprises realize the importance of E-commerce for business activities and are willing to apply E-commerce at higher levels in the future (Chandramita Bora, 2010).

For long-term and sustainable development, SMEs take advantage of the opportunities of E-commerce in order to gain the high efficiency from the application in these enterprises and to forecast challenges in case of applying E-commerce. These are the vital issues for every SME when they apply and implement E-commerce.

In order to apply and develop E-commerce, the SMEs in Vietnam have invested in technology, which is very costly and spreading. However, the efficiency of the E-commerce implementation and application is still slow and in low-level equilibrium as



well as lack of unification, causing waste for businesses.

Thus, through the fact-finding process in small and medium enterprises in Vietnam, I want to have a specific research, which is close to reality of Vietnamese enterprises, so as to help businesses to solve problems by implementing the application. The research process will be more convenient because of the practical documents of organizations, state agencies and state E-commerce's management agencies.

1.4. Research purpose

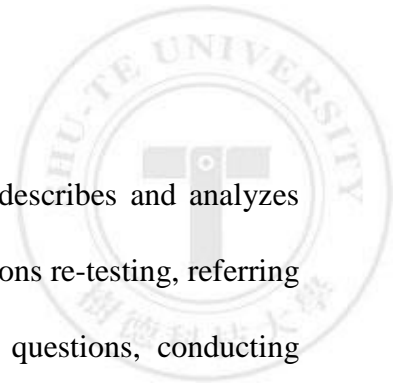
As a result, the research purpose is to find out important factors influencing acceptance of SMEs' employees in the adoption of E-commerce in Vietnamese SMEs. After that, I describe and analyze these factors with the research methods associated with questionnaires so as to collect information, evaluate objectively and scientifically. The aim of the research will be met through addressing the following question: "What are the factors affecting adoption and non-adoption of E-commerce in SMEs in Vietnam?"

Scope of the Research

The analysis scope of this thesis is in Vietnam, in particular Nam Dinh province... due to certain limitations of the financial ability and human resources.

1.5. Research procedure

The structure of the study as follows: In first part of the research, the research problem is defined. In second part, the author reviews some concepts and theories relating to the research problem, then provides a number of factors affecting on E-



commerce implementation in small and medium enterprises, describes and analyzes the factors by the research methods, designing questions, questions re-testing, referring to the professor, who has given me guidance; re-designing questions, conducting investigations under the questions: An investigation is conducted by survey, in particular questionnaire and sent via mail to employees of small and medium enterprises in Nam Dinh province; collecting data and analyzing this data. At last, the findings are reported.

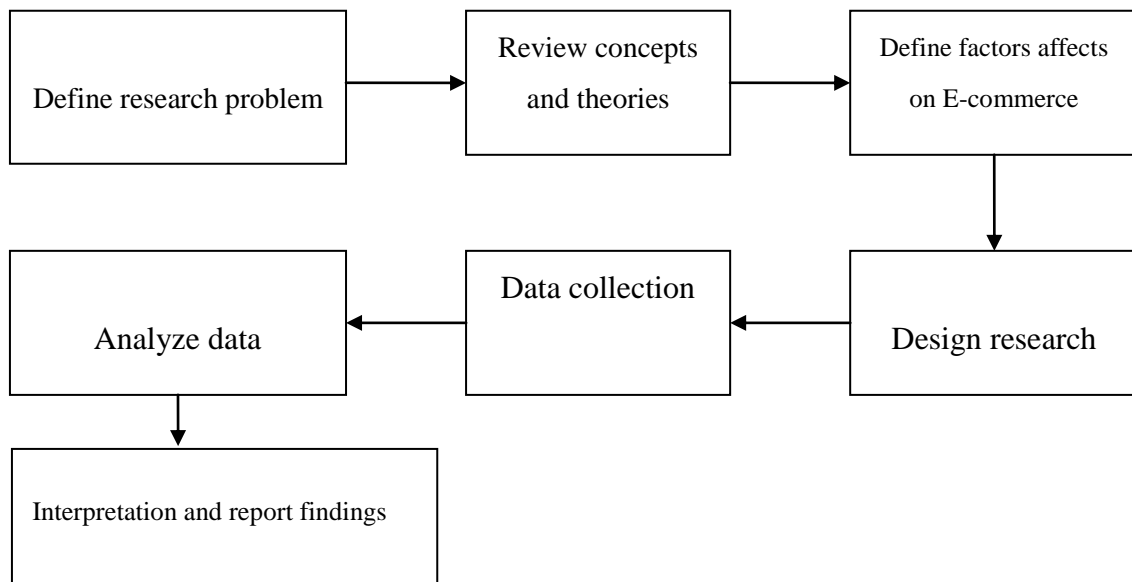
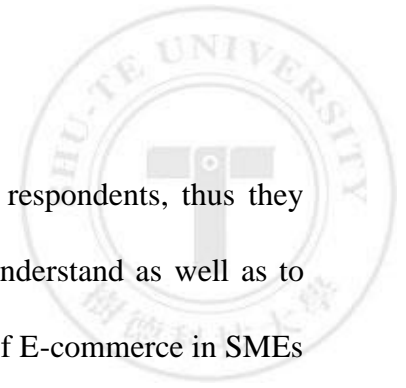


Figure 1. Research procedure

1.6. Limitation

Firstly, the number of people from which the sample was drawn was limited to the SMEs located in Nam Dinh province which may effect the generalization of the findings. Secondly, due to the fact that E-commerce is a new phenomenon in Vietnam,



its related concepts and usage is somehow unfamiliar to the respondents, thus they may have found certain questions unimportant or uneasy to understand as well as to answer. Besides, this research has just addressed the adoption of E-commerce in SMEs in Vietnam generally but has not emphasized the models such as B2C, B2B, and C2C specifically.



Chapter 2 Literature Review

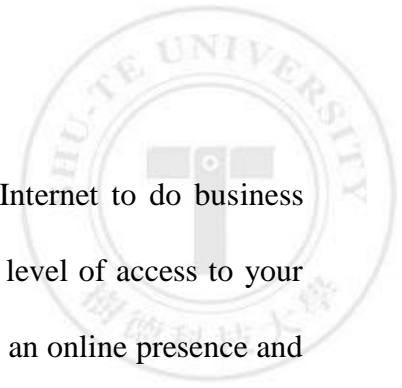
The previous Chapter presents the background and the problem discussion of this research. In this Chapter, the literature review will be present. The purpose of this Chapter is to provide the important literature in the field that is chosen for research. The Chapter is divided into three sections including detail overview of E-commerce. I will continue with the status of implementing E-commerce in Vietnam. Finally, the research model for adoption of E-commerce will be present.

2.1. E-commerce

2.1.1. E-commerce definition

In order to emphasize the significance of information transfer, Zwass, V., (1999) uses a broad definition of E-commerce: “The sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications network”.

According to the website businessstown.com: “electronic commerce is the paperless exchange of business information using electronic data interchange (EDI), e-mail, electronic bulletin boards, fax transmissions, and electronic funds transfer. It refers to Internet shopping, online stock and bond transactions, the downloading and selling of “soft merchandise” (software, documents, graphics, music, etc.), and business-to-business transactions”.



The concept of E-commerce basically means using the Internet to do business better and faster. The Internet is used to give customers some level of access to your own computer systems and serve them. This means developing an online presence and integrating your Web service into the business (*www.businessstown.com*).

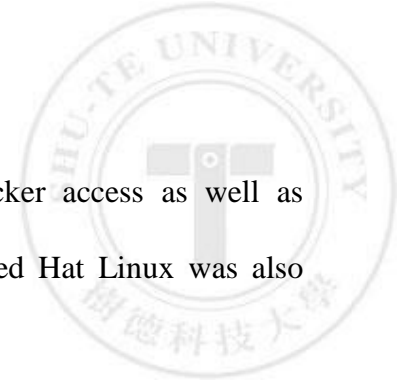
E-commerce appears in industry in three forms: inter-enterprise (business-to-business (B2B)), between enterprises and consumers (business-to-consumer (B2C)) and inter-consumer (consumer-to-consumer (C2C)) (Rayport, J. F. & Jaworski, B. J., 2003).

2.1.2. History and evolution of E-commerce in the world

Although so many studies have been done about IT adoption, E-commerce implementation in small and medium-sized businesses has only recently gained attention in academic world. Throughout the history of E-commerce, it has been totally dependent on how Information Technology enabled business processes.

There have been a lot of major steps in the history of E-commerce. The first step was the development of the Electronic Data Interchange (EDI), which was standardized and developed in 1960s to exchange business information and do electronic transactions. At first, there were several different EDI formats that business could use. Thus, it was still unable for enterprises to interact with each other. Nevertheless, the ASC X12 standards, which appeared in 1984, became stable and reliable in transferring large amount of transactions (JenNy, 2010).

The second key step was the 'point and click' web-browsers in 1992. Along with



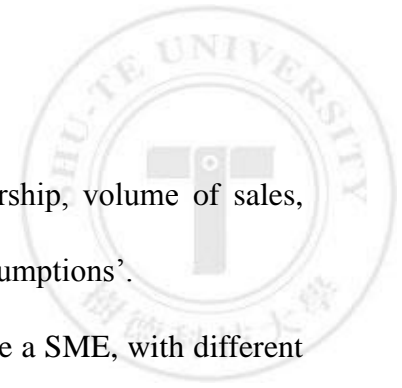
it, the development of DSL was another key allowed quicker access as well as persistent connection to the Internet. The development of Red Hat Linux was also another step of E-commerce growth (JenNy, 2010).

E-commerce began to become popular in 1994. After that, it took 4 years for E-commerce to develop the security protocols and DSL. In that time, enterprises started to consider Internet as a medium over which business could be conducted. They considered also about standardization, privacy issues, and security. Among the first Internet companies allowed electronic transactions, Amazon was the pioneer. Besides, the other famous name, eBay.com, was launched in 1995 (JenNy, 2010).

Nevertheless, in 2000, “the meaning of the word ‘E-commerce’ was changed since a great number of business companies in US and Western Europe represented their services in the World Wide Web. The term of E-commerce was defined as the process of purchasing of available good and services over the Internet using secure connections and electronic payment services” (www.ecommerce-land.com). Today, the largest electronic commerce is B2B (Business-to-Business). Consequently, the evolution of E-commerce can be attributed to a combination of regulatory reform and technological innovation.

2.2. SMEs

There is no unique definition for Small and medium-sized enterprises. According to Pobobsky, G., (1992), a study conducted by the International Labour Organization (ILO): There are a large number of criteria to identify SME, including



‘size of workforce or capital, form of management or ownership, volume of sales, client numbers, production techniques and level of energy consumptions’.

Many countries had their own definition of what constitute a SME, with different standards of income and number of employees.

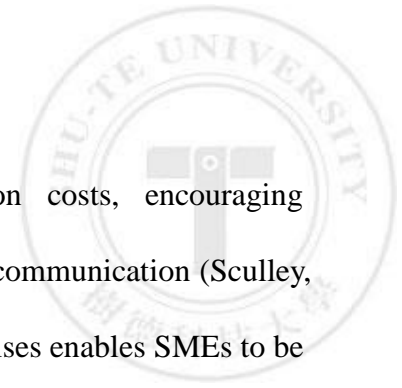
Table 1. Characteristics of small and medium industry

Sector	Category	Definition	
		Sales Turnover (RM)	Employees
Manufacturing	Micro	Less than 250,000	< 5
	Small	250,000 – less than 10mil	5 – 50
	Medium	10,000,000 – 25,mil	51 - 150
Services	Micro	Less than 200,000	< 5
	Small	200,000 – less than 1mil	5 – 19
	Medium	1mil – 5mil	20 - 50

Sources: SMIDEC (2005)

In Vietnam, a formal definition of SMEs is provided by the Government in 2001 in Decree No.91/2001/CP-ND. By 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” (www.cuts-international.org).

It’s fair to say that the advantage of E-commerce participation for SMEs relates to their ability to keep pace with a changing business environment, including



facilitated access to world market, decreasing transaction costs, encouraging competition, changing manufacturing methods and enhancing communication (Sculley, A.B., Woods, W.A., 2001). Furthermore, the size of the enterprises enables SMEs to be more adaptable and quickly responsive to changing conditions than large ones as well as to get benefit from the speed and flexibility that the electronic environment provides.

In general, small enterprises face greater risks in information technology implementation than larger businesses do due to improper resources and limited education about IT (Cragg, P.B. & King, M., 1993). In comparison with larger enterprises, SMEs have a general lack of computer knowledge as well as inadequate hardware and software, and must depend on outside resources, experience a lack of financial resources and technical support, have recruitment difficulties and have a short-range management perspective imposed by unstable competitive environment (Soh, C.P. P., Yap, C.S. & Raman, K. S., 1992). In theory, however, appropriate information system can help small businesses develop their markets, to raise sales turnover and to increase profitability, serious restrictions on financial as well as human resources often cause small enterprises to be behind large businesses in the use of information technology (Welsh, J.A. & White, T. A., 1981). Thus, not only large firms but also SMEs can benefit from E-commerce. Because SMEs have distinctive and unique computing needs as well as different technology acceptance patterns compared with large ones (Cragg, P.B. & King, M., 1993). There is a demand to investigate the applicability of the E-commerce adoption model to SMEs firms.



2.3. E-commerce in Vietnamese SMEs

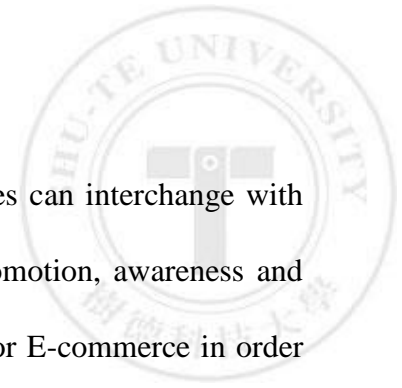
2.3.1. Implementation of E-commerce in SMEs in Vietnam

Electronic commerce started in Vietnam in mid-1990 but remained very underdeveloped. There was no offering of mail orders or telephone, except from small orders among enterprises which have already had business relationships. Only a very small number of businesses offered their products on the Internet (www.chungta.com).

Basing on experiences of international sponsors, the E-commerce development projects in Vietnam focused mainly on how to support final step to E-commerce: Increase the number of computer users; provide infrastructure on Internet and banking; help enterprises to use Internet as a new form of communication; advise legislators to promulgate regulations in order to facilitate the development of E-commerce (www.chungta.com).

Vietnam's economy has been developing rapidly in recent years and the number of Internet users in Vietnam is up to 22.4 millions in 2009, increased by 7, 9% compared to 2008 (Duc Tam, 2010). Consequently, Vietnam is a big market and E-commerce is an essential trend. At present, Vietnam has built several experimental systems such as Vietnam Cybermall, Real Estate Exchange, Electronics and mechanical appliances supermarket, computer supermarket, Blue sky, Book Store, E-business etc., they've been showing the first tries made by Vietnamese in doing E-commerce.

In order to access to E-commerce, every nation usually has to experience 3



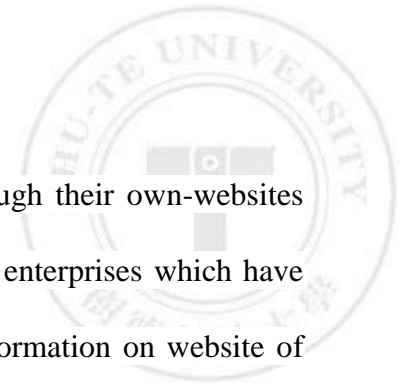
stages: Preparation – acceptance – application and these stages can interchange with each other. The preparation stage includes activities from promotion, awareness and knowledge enhancement, determination of preparation level for E-commerce in order to understand factors which need to be changed or adjusted as well as ensured to adapt in all aspects. Vietnam is implementing first steps of first stage.

On the one hand, the awareness of E-commerce has been enhanced gradually; the knowledge of E-commerce has been popularized step by step all around the country. On the other hand, E-commerce has been accepted and applied in some offices and enterprises.

Some enterprises have set up their own websites in order to present their products and services to customers or to sell and purchase online (B2C) or to connect with other enterprises (B2B). There have been a lot of successful examples like VDC Supermarket, GoodsOnlines, and WorldTradeB2B ...That is a positive signal for development of E-commerce in Vietnam. According to Vietnam's Overall Plan on Developing E-commerce in the 2006 – 2010, 60% of large enterprises will conduct B2B E-commerce, 80% of SMEs B2C or B2B, and about 10% of households B2C or B2B by 2010 (www.moit.gov.vn).

2.3.2. Factors affecting the implementation of E-commerce in SMEs in Vietnam

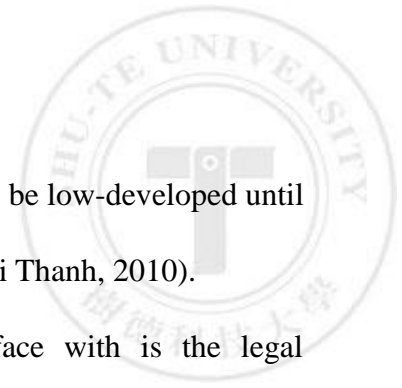
On 18 September.2009, the General Statistics Office of Vietnam published the results of the survey which showed that 91.6% of enterprises use Internet. Number of enterprises implementing E-commerce transactions was 70.4%. The status of E-



commerce application in Vietnamese enterprises: 30.6% through their own-websites and 2.3% through trading floor, 61.5% via email. The rate of enterprises which have their own website was 31.7%. The frequency of updating information on website of enterprises: 32% updated occasionally, 48% updated daily and 20% updated weekly. The ratio of enterprises whose staff is in charge of E-commerce was 7.7%. The rate of companies investing on development of E-commerce stood at only 2.5%. The level of interest in consumers of enterprises was low... Form of payment was selected by enterprises, including: 59% chose bank transfer via ATM, e-banking ... 35% in cash, 8% through post office and Online payment (credit card...) was 7% (Hai Thanh, 2010). These above figures seem to show a positive picture. However, in fact, the application and development of E-commerce in Vietnamese enterprises in general, and in SMEs in particular currently is at a low level for the following reasons:

Firstly, the incomplete legal environment and government policies make enterprises worried and nervous about how to use E-commerce rightly and legally. They must always consider risks they may face when they decide to apply a new transaction form (Duc Tho, 2007). Many E-commerce websites don't commit as well as don't require customers to commit to their responsibility for orders which they have placed (Thanh Huyen, 2003).

According to Mr. Nguyen Hoa Binh, the General Director of Hoa Binh Software Solution Joint-stock Company and owner of website www.chodientu.com, "Most of transactions on E-commerce website aim to seek for information. Only a few of



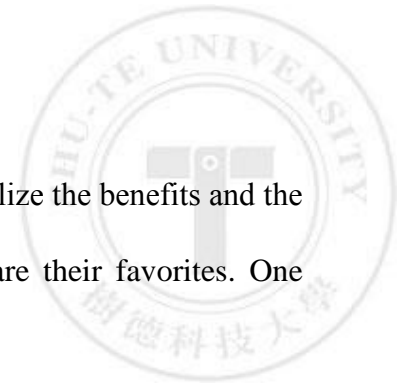
transactions have online payment. E-commerce in Vietnam will be low-developed until legal foundation on E-commerce is improved and ensured” (Hai Thanh, 2010).

Another difficulty that Vietnamese enterprises must face with is the legal framework is incomplete. It is difficult for them to get contacts with teal information in the Internet. Furthermore, Vietnam is still lack of E-commerce Law. The absence of a legal framework in e-business and E-commerce makes foreign enterprises consider seriously when trading with Vietnamese ones.

Secondly, the problems of security, online payment and confirmation are still difficult to solve. Because there is no norm for transactions in Internet, every enterprise, which does business online, has its own payment method. The payment consists of more steps: Reconfirm orders via mail, telephone, and wait for customers to transfer money through post office, and then deliver goods (Thanh Huyen, 2003). That makes buyers feel complicated and hesitant, the sellers feel unbelievable in benefits of online transaction and E-commerce. Both of them are not ready to use e-cards as well as they don't get accustomed to electronic payment (Thanh Huyen, 2003).

Besides, E-commerce relates to online transactions, it requires parties to provide sensitive information such as: credit card number, password, financial data or other data which need to be well secured through websites providing services. Thus, security is indispensable but it hasn't attracted the attention of enterprises (Thanh Huyen, 2003).

The Vietnamese consumers haven't pay attention at purchasing online, because they don't believe in the quality of products as well as services that they bought in



Internet. In the point of view business managers, they don't realize the benefits and the importance of E-commerce. So, the traditional transactions are their favorites. One more limit is the less-developed infrastructure.

In conclusion, the enhancement of E-commerce is a major problem and rather difficult to exploit broadly. The Vietnamese SMEs as well as Vietnamese government still has so many things to do right now and in future to improve and develop E-commerce.

2.4. Information system success model and factors

The D&M IS Success Model, which was developed by DeLone and McLean in 1992 (DeLone, W.H., and McLean, E.R., 1992), based on the communications research (Shannon and Weaver) (Shannon, C.E., and Weaver, W., 1949), the Mason's information "influence" theory (Mason, R.O., 1978) and empirical management information systems research studies from 1981–87. DeLone & McLean attempted to better define as well as to bring some awareness to dependant variable "success" - IS success - in order to provide guidance to future researchers and to encourage them to acknowledge the multi-dimensional, interdependent and contextual characteristics of IS success. Since that time, this IS Success Model has been referred to and made use of by more than 300 articles (DeLone W.H. and Mclean E.R., 2003). In this model, IS success's six interrelated dimensions are identified, including: System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organizational Impact, which are shown in Figure 2:

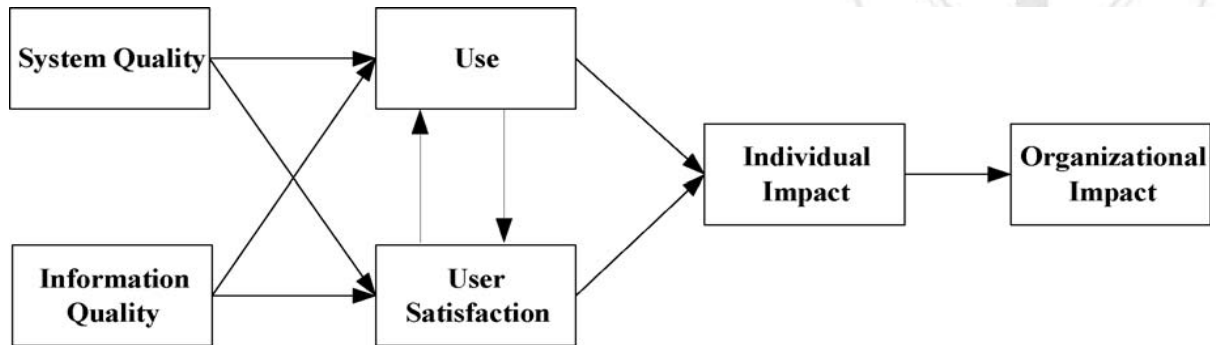


Figure 2. Success model (DeLone & McLean 1992)

However, this original IS success model still needed further validation; As a result, DeLone and McLean (2003) introduced their updated IS success model in 2003. The major differences between the original IS success model and the updated ones basically included: Firstly, Service quality was added in order to emphasize the significance of service and support in the success of E-commerce system. Secondly, they also added “Intention to Use” to aim to measure user’s attitude. Lastly, ‘Individual Impact’ and ‘Organisational Impact’ were removed and were replaced by ‘Net Benefits’. Besides, the feedback loops to ‘Intention to Use’ and “User Satisfaction’ were also added. This updated model proposed six interrelated variables to measure the success of IS including: system quality, information quality, system's use, user satisfaction and net benefits:

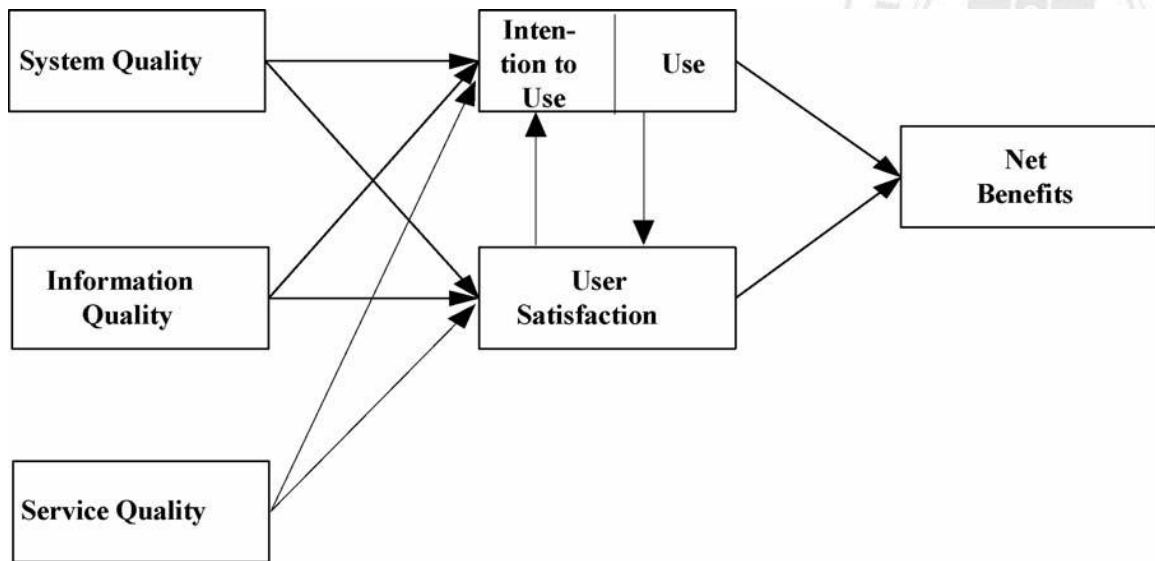


Figure 3. DeLone and McLean's updated IS success model (2003)

Source: DeLone and McLean, 2003

Chapter 3 Research Method



3.1. Research model

A framework, based on the above literature review, is developed to check the relationship between factors affecting the acceptance of SMEs' employees and the E-commerce adoption. It is shown in Figure 4. If measuring the success of a specific information system department, Service Quality maybe the most important variable. However, in order to measure the success of a single system, opposite to the IS department, Information Quality and System Quality maybe considered the two most important quality dimensions (DeLone and McLean 2003). Thus, I don't consider Service Quality as E-commerce systems are individual systems (Wen, L. S., 2005). In addition, according to Zhang (2000) and Bell & Tang (1998), in respect of E-commerce system, information quality and system quality have been considered as critical attributes in determining website success.

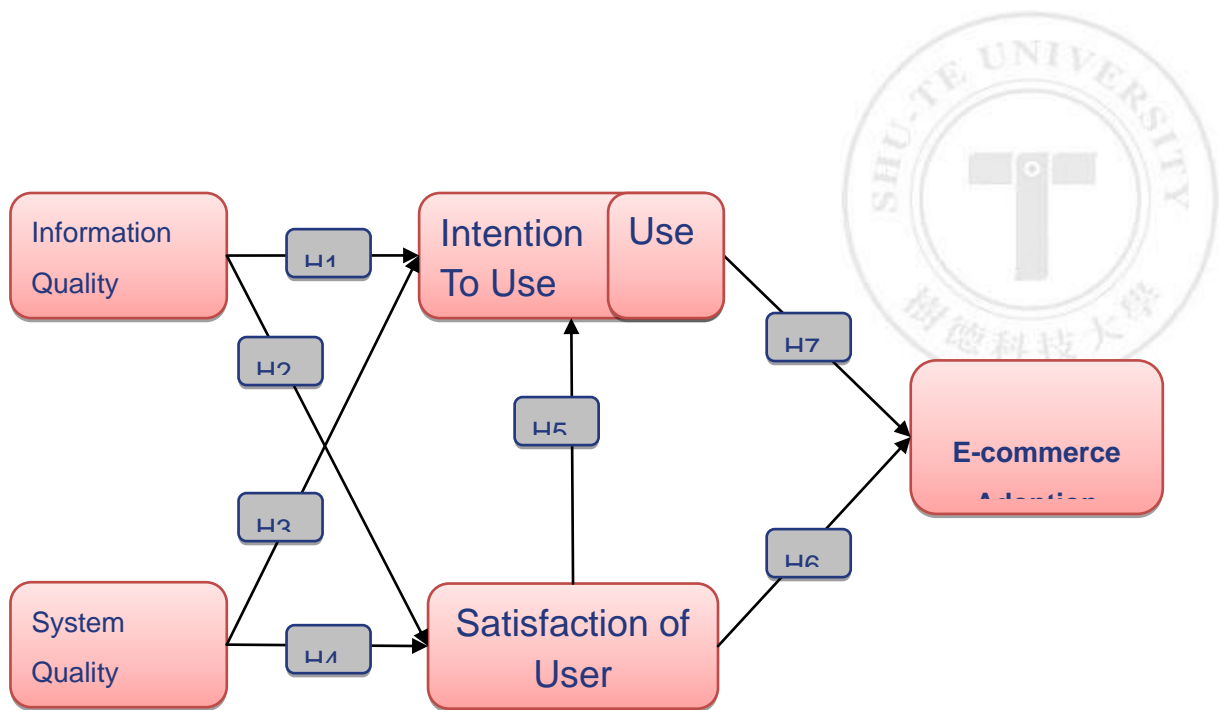


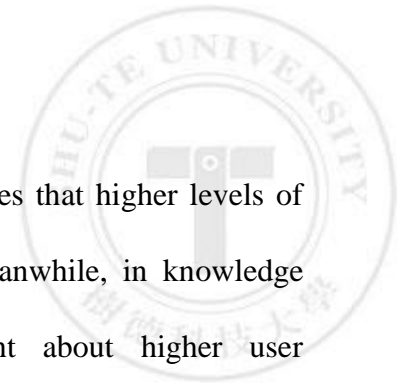
Figure 4. E-commerce research model

3.2. Research hypotheses

As the research model of this research has been established as well as based on research purpose and literature review above, the hypotheses of this study were developed as follows:

3.2.1. Information quality

Information quality of a system is referred to “a measure of the information system outputs” (DeLone, W.H., and McLean, E.R., 1992). This concept is especially important in relation to E-commerce because the provision of information is the basic goal of any web site (Huizingh, Eelko K.R.E., April 2000). The updated D&M IS success model (2003) provides five information quality constructs of E-commerce success that will be considered for use in this research including: Completeness, Ease of Understanding, Personalisation, Relevance, and Security (DeLone, W.H. and



McLean, E.R., 2003). D&M IS success model (1992) proposes that higher levels of information quality result in increased user satisfaction. Meanwhile, in knowledge management systems, higher information system brought about higher user satisfaction (Wu, J. H. and Wang, Y. M., 2006). Besides, higher levels of information quality also may lead to higher intention to use E-commerce:

H1: Information quality is positively related to intention to use E-commerce.

H2: Information quality is positively related to satisfaction of User.

3.2.2. System quality

System quality refers to ‘the measurement of the information processing system’ (DeLone, W.H., and McLean, E.R., 1992). In addition, a number of researchers refer to system quality as ‘the ease of finding the information on the system’. Thus, according to D&M Is success model (1992), online system quality consists of traditional system quality characteristics such as reliability, accuracy, flexibility, response time and ease of use as well as the more encompassing concept of seamless site performance (Molla and Licker, 2001). DeLone and McLean (2003) also explained that system quality can be measured technically. In the event of E-commerce research, there are five dimensions that will be considered for use in this study: Adaptability, availability, reliability, response time and usability. According to Wu, J. H. and Wang, Y. M., (2006), in knowledge management system, the higher the system quality it was, the more user satisfaction it became. Besides, the higher system quality may make more intention to use E-commerce:



H3: System quality is positively related to intention to use E-commerce.

H4: System quality is positively related to satisfaction of user.

3.2.3. Satisfaction of user

‘User satisfaction remains a relevant meaning of measuring customers’ attitude to E-commerce system and covers the entire customer experience cycle of IS from purchase, payment, receipt and service’ (DeLone, W.H. and McLean, E.R., 2003). Repeat purchases, repeat visits and user surveys are three dimensions that will be considered for use in this study (DeLone, W.H. and McLean, E.R., 2003). There were a large numbers of reports about the researches such as e-repurchase (Tsai & Huang, 2007), online learning systems (Lin, 2007), that showed out user satisfaction had important and positive effect on intention to use.

H5: Satisfaction of user is positively related to intention to use E-commerce.

H6: Satisfaction of user is positively related to E-commerce adoption.

3.2.4. Intention to use or usage

Usage is referred to “measures everything from a visit to a Website, to navigation within the site, to information retrieval, to execution of a transaction” (DeLone, W.H. and McLean, E.R., 2003). The updated D&M IS success model (2003) provides five usage constructs of E-commerce success that will be considered for use in this research: Nature of use, navigation patterns, number of site visits and number of transactions executed (DeLone, W.H. and McLean, E.R., 2003).

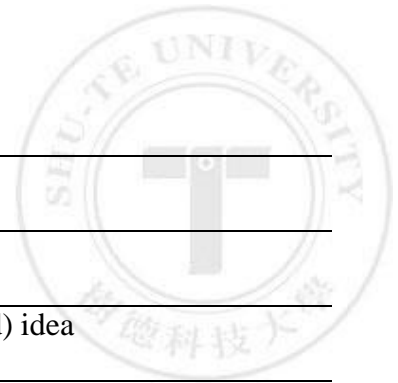
H7: E-commerce’s intention to use is positively related to E-commerce adoption.



3.3. Measurement of variables

Table 2. Measurement of Variables

Variable	Content of item
System Quality	Does E-commerce provide up-to-date information?
	Do you get the information you need in time?
	Is the time to response of your E-commerce is very quickly?
	Is information which E-commerce provided accurate?
Information Quality	Does your E-commerce provide the precise information you need?
	Does your E-commerce provide output that is exactly as what you need?
	Does your E-commerce provide information ease to understand?
	Does your E-commerce provide complete information you need?
Intention to use	I intend to use E-commerce rather than discontinue its use
	My intention are to continue using E-commerce than use traditional trading
	If I could, I would like to continue to use E-commerce
Satisfaction	I am satisfied with using E-commerce
	I liked using the system



	Using the system was pleasant
	Using the system was enjoyable
E-commerce adoption	E-commerce adoption is a (bad/good) idea
	E-commerce adoption is a (foolish/wise) idea
	I (like/dislike) E-commerce adoption

3.4. Data collection

3.4.1. Data collection methods

In order to investigate the factors affecting acceptance of SMEs' employees in the E-commerce adoption in Vietnamese SMEs, questionnaires were delivered to employees of 2 SMEs in Nam Dinh provinces. Questionnaires were constructed based on an extensive review of the literature in the IS area. All the questionnaire form and sample are translated into Vietnamese.

A questionnaire includes 2 parts: In part one, respondents were required to fill-in their personal information in order to understand their gender, age, previous job, years of recent job and field of study. After that, they were required to fill-out the questions in part 2, pointing out responses to questions on a five-point scale from 1- strongly disagree to 5 – strongly agree. This part contained items measuring antecedents of E-commerce adoption (Information quality, system quality, Usage or Intention to use, Satisfaction of user). Data collection lasted one week.



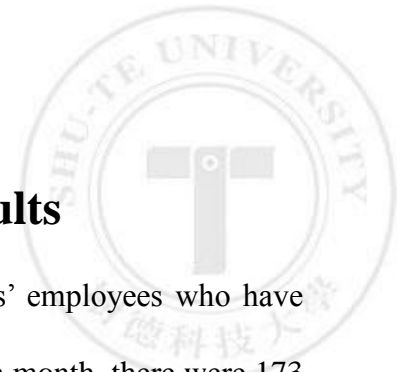
3.4.2. Population

I've chosen the size of SME's according to the definition of SMEs by the Vietnamese Government in 2001 that enterprises have registered capital of not more than VND 10 billions or the annual average number of labor of not more than 300 people for my research work. It was because that this definition is fit with our economic practice.

The selected SMEs enterprises have to meet the following criteria: These businesses have implemented an E-commerce application. Besides, these companies locate in Nam Dinh province.

3.4.3. Sampling method: random sampling

In this research, the population of interest is the SMEs in Nam Dinh province. Besides, the unit of analysis is employees of these SMEs. The population element in this research has a known and an equal chance of selection.



Chapter 4 Research Results

A total 340 samples of questionnaire were sent to SMEs' employees who have directly used in their enterprises in Nam Dinh province. After a month, there were 173 feedbacks with 20 samples in poor quality responses; finally we have 153 samples in good quality left. I use software SPSS 13.0 package to analyze and test the hypotheses of this study. The statistical analysis methods and results adopted are as follows:

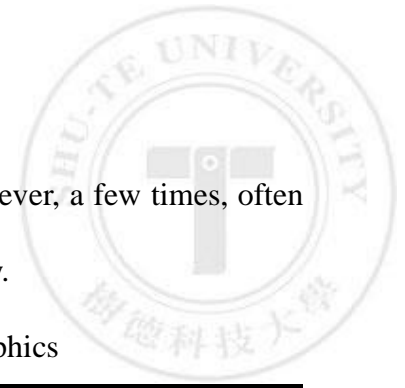
4.1. Descriptive analysis of sample demographics

For the first stage of analyzing the data collected from the survey, descriptive analysis has been employed to understand the sample respondents.

The characteristics of employees of these SMEs include five major demographics: Gender, age, position or major job, duration of employment in SME and frequency of use or approach E-commerce.

As shown in Table 3, there were 153 respondents complete the questionnaire; 58.2% of employees are female and 41.8% are male. Moreover, the percentage of the respondents for age between less than 30, between 30-39, 40-50 and over 50 are 8.5%, 53.6%, 27.5%, and 10.5%, respectively, so most of the respondents in this study are at the age of 30 to 39 years old (more than 53%). And in which 39.6% of them are Head officer and 60.4% are officer.

Also from the descriptive statistics of these samples, we can see that most of the respondents have major job in business (41.8%), whereas the percentage of employees having major job in social, engineering and other are respectively 23.5%, 15.0% and



19.6%, and the frequency of E-commerce approach or use is never, a few times, often and quite a lot are 2.6%, 19.0%, 38.6% and 39.9%, respectively.

Table 3. Characteristics of sample demographics

Measure	Item	Frequency	Percentage (%)
Gender	Male	64	41.8
	Female	89	58.2
Age	Under 30	13	8.5
	From 30 – 39	82	53.5
	From 40 – 50	42	27.5
	Over 50	16	10.5
Position	Manager	72	47.1
	Employer	81	52.9
Major job	Business	64	41.8
	Social	36	23.5
	Engineering	23	15.0
	Other	30	45.7
Duration of employment in SME	Less than 1 year	10	6.5
	From 1 to 3	10	6.5
	Over 3 to 5	63	41.2
	More than 5	70	45.8
The frequency of E-commerce approach or use	Never	4	2.5
	A few times	29	19.0
	Often	59	38.6
	Quite a lot	61	39.9



4.2. Reliability analysis of the major variables

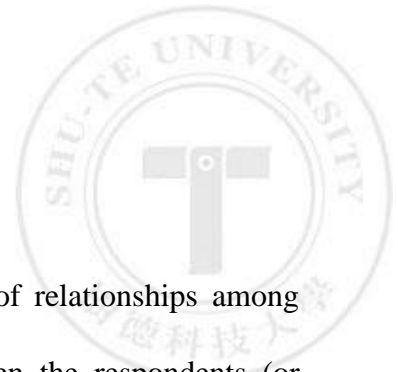
Prior to the hypotheses testing, the research instruments were tested for reliability.

In order to test the reliability of the items measuring the constructs as well as to ensure that the measurement scale of our questionnaire is highly representative of each variable, the Cronbach's alpha is used. I measure the reliability of the measurement for the five constructs, including perceptions about the System Quality, Information Quality, Intention to use, satisfaction of User and E-commerce Adoption. Constructs with Cronbach's α below 0.5 will be deleted.

Cronbach's α is to test the degree to which the observed variable measures the "true" value and whether the measures are free from error. Throughout the test we find out that all five constructs gain the significant Cronbach's alpha and are greater than 0.7. That implies that the constructs have high reliability. The result is shown in the Table 4:

Table 4. Reliability test

Constructs	Items	Cronbach's α
System Quality	4	0.988
Information Quality	4	0.989
Intention to use	3	0.991
Satisfaction	4	0.984
E-commerce Adoption	3	0.994



4.3. Factor analysis

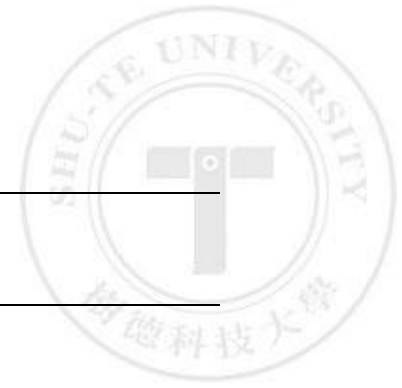
Factor analysis can be used to determine the structure of relationships among respondents (or items) by examining the correlations between the respondents (or items). With the factor analysis, we can identify the separate dimensions of the structure and then determine the extent to which each variable is explained by each dimension. Once these dimensions and the explanation of each variable are determined, we can do summarization and data reduction.

Firstly, in order to assess construct validity and identify the unique dimensions of each construct, factor analysis with VARIMAX rotation was employed. Construct validity examines the extent to which a construct measures the variable of interest. In other words, it should demonstrate relatively high correlations between items of the same construct (convergent validity) and low correlations between items of constructs that are expected to differ (discriminant validity).

Table 5 shows the results of the VARIMAX rotation on the original 18 items constrained to five factors:

Table 5. VARIMAX Rotated component analysis (Factor-Loading Matrix)

	Factor loadings				
	System Quality	Information Quality	Intention to use	Satisfaction	E-commerce
SQ1	0.832				
SQ2	0.817				
SQ3	0.827				
SQ4	0.824				
IQ1		0.763			
IQ2		0.781			
IQ3		0.742			



IQ4	0.756	
IU1	0.681	
IU2	0.668	
IU3	0.659	
S1	0.690	
S2	0.663	
S3	0.718	
S4	0.703	
EA1		0.742
EA2		0.743
EA3		0.732

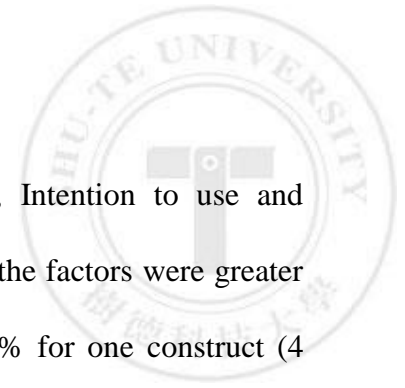
Hair et al. suggested that an item is significant if its factor loading is greater than 0.50. From the initial 18 items, their factor loading is greater than 0.50 so it should demonstrate relatively high correlations between items of the same construct.

Then, exigent value as well as cumulative percent of variance explanation is shown in the Table 6.

Table 6. Eigenvalue and cumulative percent of variance explanation

Variable	Factor	Eigenvalue	Percent of Variance (%)	Cumulative Percent of Variance (%)
System Quality	1	3.859	96.482	96.482
Information Quality	1	3.876	96.893	96.893
Intention to use	1	2.949	98.284	98.284
Satisfaction	1	3.821	95.535	95.535
E-commerce Adoption	1	2.967	98.889	98.889

From the Table 6, we can see that for the perceptions about the E-commerce Adoption variable, the cumulative percentages of variance explained by the factors were greater than 98.88% for one construct (3 items are analyzed). For the perceptions



about the variables of system quality, Information Quality, Intention to use and Satisfaction, cumulative percentages of variance explained by the factors were greater than 96.48% for one construct (4 items are analyzed), 96.89% for one construct (4 items are analyzed), 98.28% for one construct (3 items are analyzed) and 95.53% for one construct (4 items are analyzed), respectively. All the Eigenvalues are greater than 1.

4.4. Regression analysis

In this study, linear regression was adopted to examine the relationships between independent variables and dependent variables to test our research hypotheses. In order to determine whether the higher level of information quality, system quality and satisfaction will lead to higher level of their intention to use E-commerce (H1, H3, and H5) is one of the research purposes. Besides, to identify whether the higher level of information quality, system quality of using E-commerce will lead to the satisfaction of user (H2, H4). In the meantime, to identify whether the higher level of intention to use and the satisfaction of user about E-commerce will lead to E-commerce adoption (H6, H7) is also tested in this study.

4.4.1. Linear regression analysis for employees' intention to use

The results of linear regression analysis for employees' Intention to use E-commerce are shown in the Table 7.

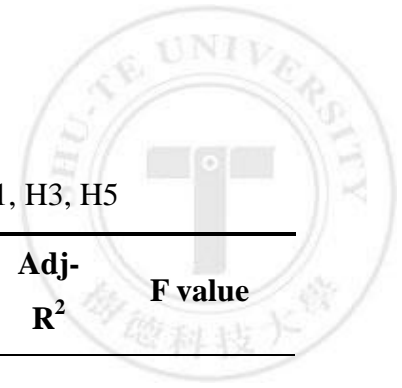


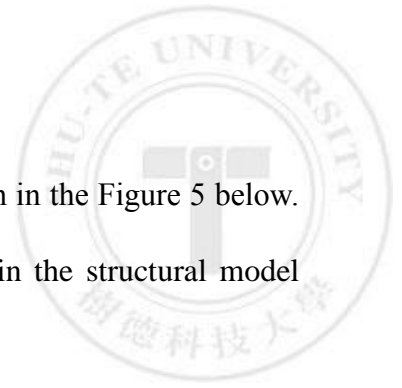
Table 7. Linear regression analysis for testing H1, H3, H5

Constructs	St. coefficients β	t value	VIF	R ²	Adj-R ²	F value
Information Quality	0.452***	7.309	2.872			
System Quality	0.193**	2.653	3.975	0.801	0.797	200.339***
Satisfaction of User	0.314***	4.092	4.417			

Dependent variable: Intention to use

***p<0.001, **p<0.01, *p<0.05, +p < 0.1

The final model shown in the Table 7 had a good overall fit ($F = 200.339$, $p = 0.000$). Furthermore, at significant level 0.05, Information Quality, System Quality and Satisfaction of User (H1, H3 and H5) have significant positive relationships with Intention to use E-commerce. Therefore, we conclude that hypotheses H1, H3 and H5 are supported. We also can see in the table that the adjusted R2 value for three constructs, namely Information Quality, System Quality and Satisfaction about Intention to use E-commerce is 0.797. It means that the explanation ability of the independent constructs is good for our dependent variable, Intention to use E-commerce. Among factors (including Information quality, System quality, User Satisfaction), the most important one to explain the influence on Intention to use is Information Quality ($\beta = 0.452$); the second will be Satisfaction of User ($\beta = 0.314$);



next is System Quality ($\beta = 0.193$). The results also can be seen in the Figure 5 below. It illustrates the estimated coefficients and their significance in the structural model between Factors and “Intention to use”.

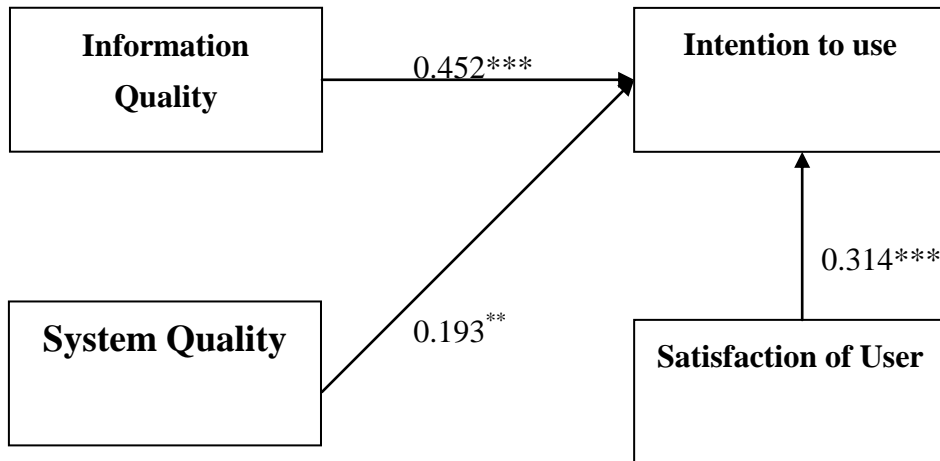


Figure 5. Path coefficients for research model between factors and “Intention to use”

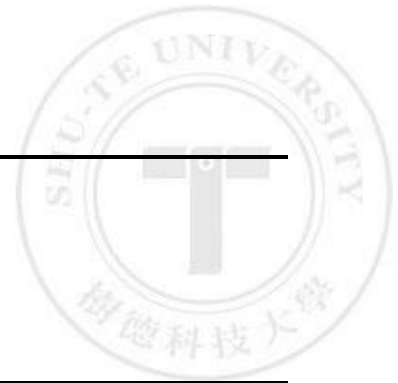
(Path Significance *** $p < 0.001$, ** $p < 0.01$)

4.4.2. Linear regression analysis for satisfaction of user at E-commerce

The results of linear regression analysis for Satisfaction of user in E-commerce are shown in the Table 8.

Table 8. Linear regression analysis for testing satisfaction of user in E-commerce

	Const	St.	t	l	.	F
ructs	coefficients β	value	IF	2	dj-R2	value
Infor						
mation		0.332*	5	((256.
Quality	**	.533	.385	.774	.771	255***



		0.600*	9
System	**	.996	.385
Quality			

Dependent variable: Satisfaction of user

***p<0.001, **p<0.01, *p<0.05, 0.05<+p < 0.1

The final model shown in the Table 8 had a good overall fit ($F = 256.255$, $p = 0.000$). In addition, at significant level 0.05, System Quality and Information Quality (H2, H4) have significant positive relationships with Satisfaction of User at E-commerce. We also can see in the table that the adjusted R2 value for the construct of System Quality and Information Quality is 0.771, meaning that the explanation ability is good for our dependent variable, Satisfaction of User.

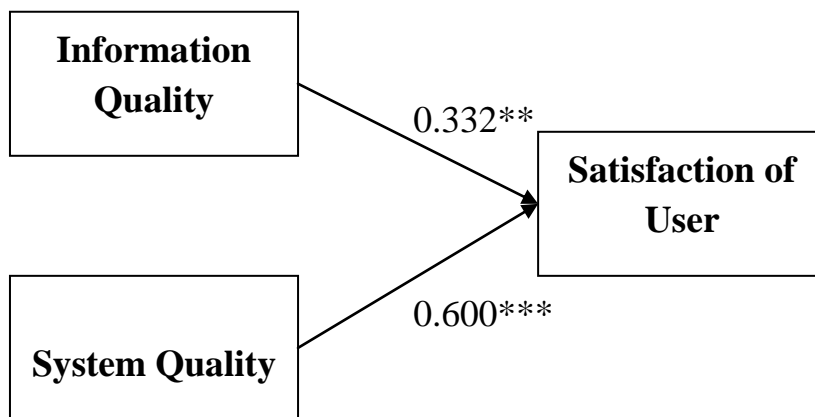


Figure 6. Path coefficients for research model between factors and “Satisfaction of User”

(Path Significance ***p<0.001, *p<0.05)



4.4.3. Linear regression analysis for E-commercial adoption

The results of linear regression analysis for E-commercial adoption are shown in the Table 9.

Table 9. Linear regression analysis for testing H6, H7

Constructs	Const	St. coefficients β	t value	IF	Adjusted R ²	F value
Intention to use	0.255**	0.25	3.515	.316	.758	239.642***
Satisfaction of user	0.648***	0.64	8.929	.316	.758	642***

Dependent variable: E-commerce adoption

***p<0.001, **p<0.01, *p<0.05, +p < 0.1

The final model shown in the Table 9 had a good fit (F = 239.642, p = 0.000). And at significant level 0.05, intention to use and satisfaction of user of E-commerce (H5, H6) has significant positive relationships with E-commerce adoption. We also can see in the table that the adjusted R² value for the construct of intention to use and satisfaction of user of E-commerce is 0.758, meaning that the explanation ability is good for our dependent variable, E-commerce adoption.

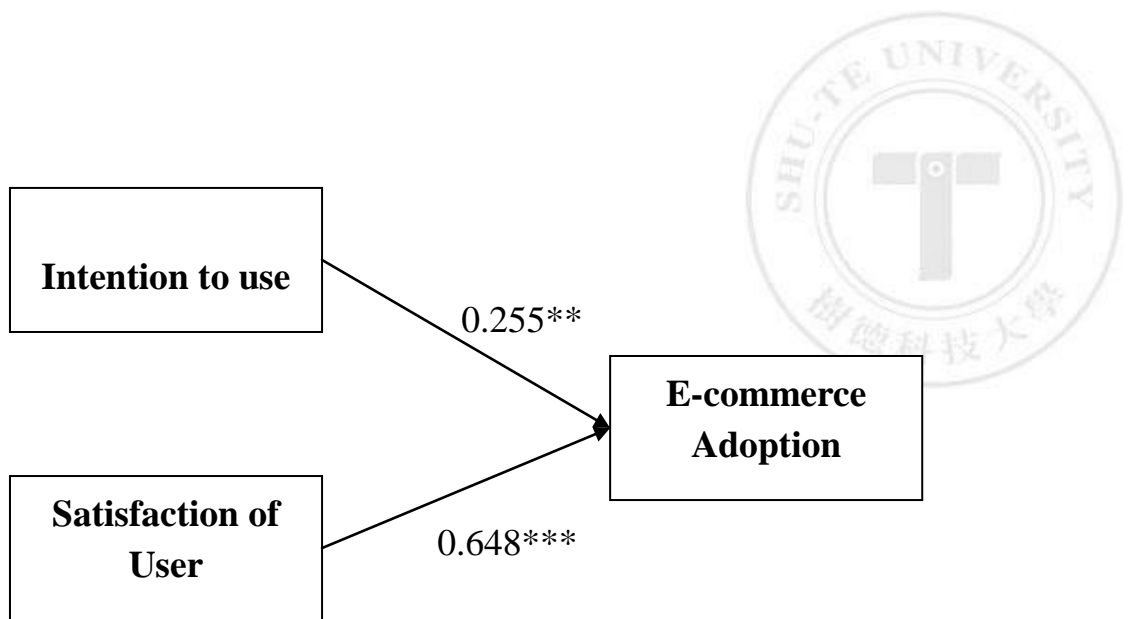


Figure 7. Path coefficients for research model between factors and “E-commerce Adoption”

(Path Significance *** $p < 0.001$, * $p < 0.05$)

Finally, the results of Linear Regression Analysis can be seen in the Figure 8. It illustrates the estimated coefficients and their significance in the structural model.

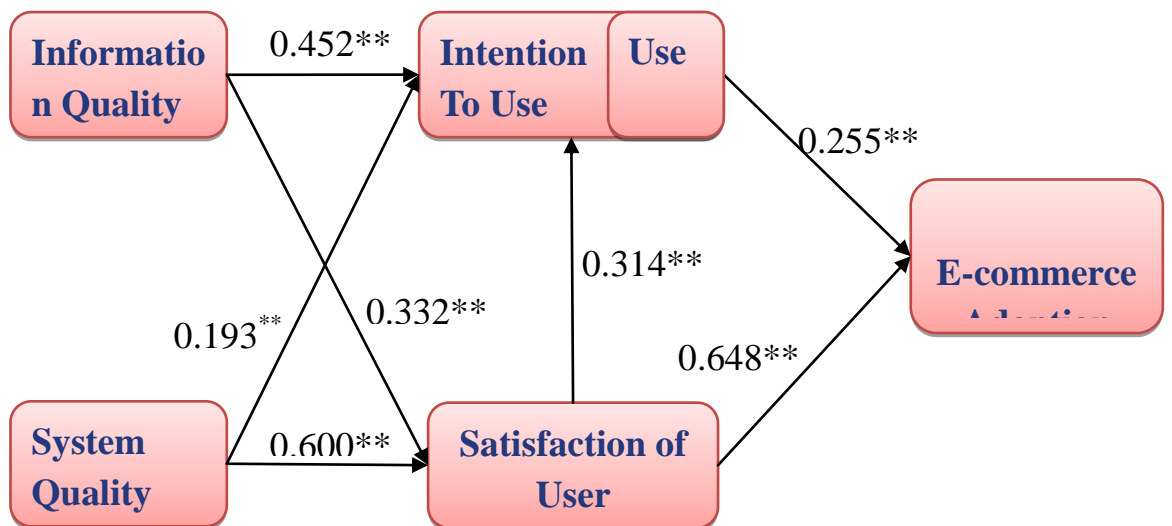


Figure 8. Path coefficients for research model

(Path Significance *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$)





Chapter 5 Research Conclusions

In this Chapter, conclusions based on data analysis as well as research findings are presented. After that, implication and contribution for theory based on empirical result are also presented. At last, limitation and implication for further research are proposed.

5.1. Research findings

The purpose of this research was to understand the influence of factors (perceptions including information quality, system quality, satisfaction of user, intention to use) on the acceptance of SMEs' employees in the adoption of E-commerce in Vietnam. The results of all hypotheses are shown below in the table 10.

Table 10. Research hypotheses and results

Research Hypotheses	Results
H1: Information Quality is positively related to Intention to Use E-commerce	Supported
H2: Information Quality is positively related to Satisfaction of User	Supported
H3: System Quality is positively related to Intention to use E-commerce	Supported
H4: System Quality is positively related to Satisfaction of User	Supported
H5: Satisfaction of User is positively related to Intention to Use E-commerce	Supported
H6: Satisfaction of User is positively related to E-commerce Adoption	Supported
H7: Intention to use E-commerce is positively related to E-commerce	Supported

Adoption

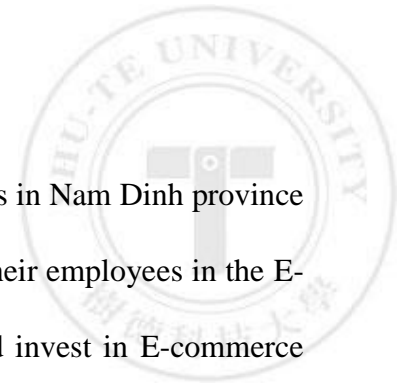
The results indicate that the two factors (User Satisfaction, Intention to Use) have significant positive relationships with the E-commerce adoption. Besides, the two remained factors (Information quality and System quality) are also positively related to the two factors (User Satisfaction, Intention to Use). According to the SMEs' employees, the Information quality of E-commerce is the determinant affecting their intention to use E-commerce the most; Satisfaction at using E-commerce and the System quality of E-commerce are the second and the third.

Up to now, in Vietnam, there have been few of specific empirical researches addressing the technology adoption generally and E-commerce adoption particularly: The research on the adoption model of E-commerce of Huy and Fliatrault (2006) and the study researching on factors influencing the adoption of E-commerce in SMEs in Vietnam in the view of users and prospectors. And my study is the third.

5.2. Research implications

Despite its limitations, my study has both theoretical and practical implications.

In theory, my thesis has indicated that the IS Success Model may be applied in order to analyze factors affecting the deployment of E-commerce system in Vietnamese SMEs. Applying this model to research on E-commerce in Vietnam and for SMEs' employees has been done for the first time in this research. Previous researches on E-commerce adoption often applied TAM to make research on E-commerce implementation.



In practice, this conclusion helps SMEs' managers/ owners in Nam Dinh province can assess what important factors affect on the acceptance of their employees in the E-commerce adoption. It is also a basis for decision that should invest in E-commerce system or not? In order to make sure that the investment in E-commerce system will be successful, what measure one enterprise should take? Etc.

My thesis has mentioned only one way of approach: How to implement E-commerce successfully through the IS Success Model. However, through the results of my thesis, I hope that it will help SMEs' employees and their managers (owners) to understand more about the E-commerce in general and make reasonable decisions in implementing E-commerce applications in their enterprises.

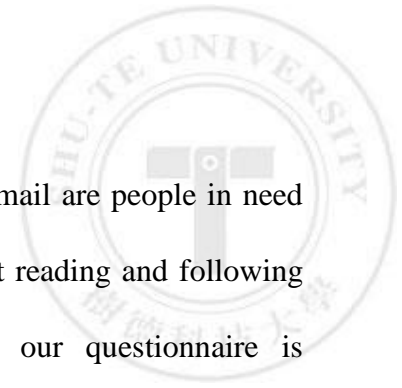
5.3. Limitations

Firstly, the population from which the sample was drawn was limited to the SMEs located in Nam Dinh province which may influence the generalization of the findings.

Secondly, the number of enterprises in Nam Dinh province, which have applied E-commerce, is still few. This led to number of samples is limited.

Thirdly, although E-commerce has appeared in Vietnam for a long time, it is only used in some particular enterprises under the form of online selling or electronic transactions in banks, etc. E-commerce is a new phenomenon in Vietnam and its related concepts as well as usage in some way unfamiliar to respondents, so some certain questions may be difficult or irrelevant for them to understand.

Besides, the use of survey questions via email affected the quality of the sample,



because it cannot be controlled whether the respondents via email are people in need of questioning or not. They may answer the questions without reading and following the construction because they found out that answering our questionnaire is unimportant and unnecessary. As the result, the answer may not be remarked accurately.

Finally, although the results showed that in the E-commerce context, the information quality, system quality, intention to use and satisfaction affect acceptance of SMEs' employees, it is significant to realize that other factors may also play an important role in their acceptance. Previous researches have found out that knowledge of the employees, attitudes of the managers, the culture of enterprises may be the important factors influencing on the implementation of E-commerce.

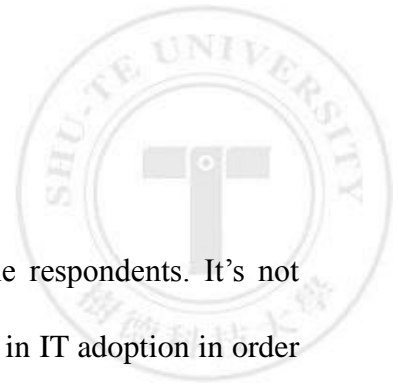
5.4. Further study

Limitation of this research provided implication for further study. I suggest the following ideas that further study could do.

The first is to expand research into big cities, where there are many enterprises which have deployed E-commerce system. Future research could overcome this limitation by expanding the scope of studies to include larger and elder enterprises.

The second is to combine survey via email with direct interview.

The third, though thesis has researched important variables, future studies could focus on or expand to some variables e.g. How the culture of enterprises, knowledge of the employees, attitudes of the managers or the government's role affect the



implementation of E-commerce.

Finally, future researches should expand the scope of the respondents. It's not only the SMEs' employees, but also may be customers, experts in IT adoption in order to have an overall view of E-commerce adoption as well as internal and external factors affecting on the implementation of E-commerce.

In conclusion, information quality, system quality, satisfaction of user and intention to use are critical factors for implementing E-commerce. This study highlights the positive relationships among information quality, system quality, intention to use, satisfaction of user and E-commerce adoption. Obviously, like many other developing countries, the implementation and use of E-commerce in Vietnam is only in the early stage. Nevertheless, the adoption of E-commerce will allow enterprises, in which SMEs, of Vietnam to take part in the global economy. As stated above in Chapter I, E-commerce becomes more and more popular and more and more firms on the world applied it. So, in order to catch up with the global economy, the adoption of E-commerce in Vietnamese enterprises is essential.

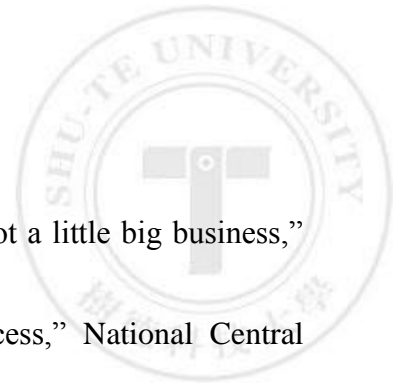


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Appendix: Research Questionnaire

QUESTIONNAIRE SURVEY

Shute University

MIS department



October, 2010

Dear Linguistics,

I am graduate student of Institute of Information Management, Shu-Te University, Kaohsiung, Taiwan (STU Taiwan). I am conducting the research “Factors Affecting Managers’ Acceptance in the Adoption of E-commerce in Vietnamese SMEs” as a partial fulfillment of the graduation requirements for the Master of MIS program at Shu-Te University (STU-Taiwan).I’m very proud of listen your ideas about this research.

Electronic commerce has become a new trend and plays a significant role in economy. E-commerce can be considered as a process of purchasing, selling, transferring, or exchanging products, services, and/or information through electronic networks, consisting of the Internet. It includes B2B (Business-to-Business), B2C



(Business-to-Consumers), C2C (Consumer-to-Consumer), online banking...

Considering this modern technology, the purpose of this research is identifying what factors affecting employees' acceptance in the E-commerce adoption in SMEs. Your time, answers and experiences are greatly valuable contribution to the outcomes of the research. I hope you will spend your time on completing this survey questionnaire. All information provided will be treated as confidential and only use for this research target.

For further information, please feel free to contact me via my email address:

vulhkbnd@gmail.com. Thank you very much for your attention and help!

Best regards,

Le Huu Vu

^{2nd}- year graduate student,

Graduate Department of

Information Management, Shu-Te

University,

Taiwan (R.O.C)

Hsiao, Kuo-Lun. PhD

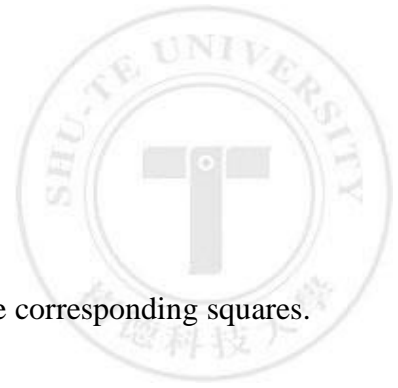
Advisor

Assistant Professor, Department of

Information Management, Shu-Te

University,

Taiwan (R.O.C)



PART I: GENERAL INFORMATION

This section covers personal information. Please tick the corresponding squares.

Gender

- Male Female

Age

- Under 30 From 30 to 39 From 40 to 50

Over 50

Position

- Manager Employer

Major

- Business Social Engineering Other

—

How long have you been working in SME?

- Less than 1 year From 1 to 3 Over 3 to 5

More than 5

Had you ever approached or use E-commerce?



- Never
 A few times
 Often
 Quite a lot

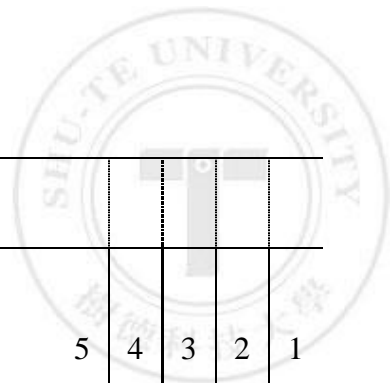
PART II: USING IT

This section includes items concerning your behavioral intention toward adoption of Ecommerce in SME. Please circle the numbers corresponding with your degree of agreement to each item with the denoted scale: “5”= strongly disagree; “4”= disagree; “3”= Neutral; “2”= Agree; “1” = strongly agree.

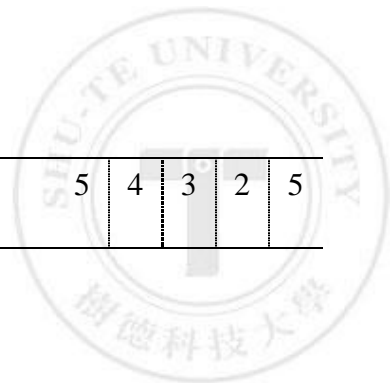
System Quality

Strong agree
Agree
Neutral
Disagree
Strong disagree

1. Does E-commerce provide up-to-date information?	5	4	3	2	1
2. Do you get the information you need in time?	5	4	3	2	1
3. Is the time to response of your E-commerce is very quickly?	5	4	3	2	1
4. Is information which E-commerce provided accurate?	5	4	3	2	1
Information Quality					
5. Does your E-commerce provide the precise information you need?	5	4	3	2	1
6. Does your E-commerce provide out put that is exactly as what	5	4	3	2	1



you need?					
7. Does your E-commerce provide information ease to understand?	5	4	3	2	1
8. Does your E-commerce provide complete information you need?	5	4	3	2	1
Intention to use (1)					
9. I intend to use E-commerce rather than discontinue its use	5	4	3	2	1
10. My intention are to continue using E-commerce than use traditional trading	5	4	3	2	1
11. If I could, I would like to continue my use E-commerce	5	4	3	2	1
Satisfaction (2)					
12. I am satisfied with using E-commerce	5	4	3	2	1
13. I liked using the system	5	4	3	2	1
14. Using the system was pleasant					
15. Using the system was enjoyable	5	4	3	2	1
E-commerce Adoption					
16. E-commerce adoption is a (bad/good) idea	5	4	3	2	1
17. E-commerce adoption is a (foolish/wise) idea	5	4	3	2	1



18. I (like/dislike) E-commerce adoption	5	4	3	2	5
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PART III: COMMENTS AND SUGGESTIONS

This section is administered for your comments on current applications of E-commerce in SME as well as your any suggestions to its improvement in next time. Moreover, please feel free let me know your thoughts and ideas concerning your intentions for applying E-commerce in SME. It's grateful idea to improve business performance of SME.

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Thank you very much for your help!