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College of Informatics

Graduate School of Information Management

Master Thesis

Consumer Behavior Intention towards M-Commerce in Vietnam

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樹德科技大學博碩士論文授權書

本授權書所授權之論文為授權人 黎清黃 在樹德科技大學 資訊 學院 資訊管理 系所____組 98 學年度第 二 學期取得 □博士 ☑碩士 學位之論文。

論文名稱：Consumer Behavioral Intention towards of M-commerce in Vietnam

指導教授：Ming-Hsiung Hsiao 蕭銘雄

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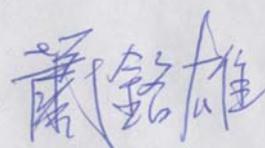
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本校資訊管理研究所 黎清黃君 所提之論文

Consumer Behavioral Intention Towards of M-commerce in

Vietnam

係由本人指導撰述，同意提付審查。

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中華民國　99　年　6　月　12　日

Consumer Behavior Intention towards M-commerce in Vietnam

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ABSTRACT

Mobile commerce (M-commerce) refers to the ability to conduct wireless commerce transactions using mobile applications in mobile devices. It is a new concept and is emerging in a context of an established norms, rules and standards. Mobile commerce is marking the start of new era of innovation in business. M-commerce will continue to extend the way organizations conduct business, and change the relationships between companies, customers, suppliers and partners. Advances in wireless technology have increased the number of people using mobile devices and accelerated the rapid development of M-commerce conducted with these devices. This research explores how Vietnamese are influenced to adopt the M-commerce. The research employs the Technology Acceptance Model (TAM) to examine factors affecting the Vietnamese's attitude toward this emerging mobile technology and applications. This study presents an extended technology acceptance model that integrates innovation diffusion theory to investigate what determine user mobile commerce acceptance, in which we explore the relationships among those following factors, namely, perceived usefulness, perceived ease of use, perceived trust , perceived self – efficacy, attitude toward using M-commerce and behavior intention to use M-commerce

Keywords: Mobile commerce, perceived usefulness, perceived ease of use, perceived trust, behavioral intention.

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Chapter 1   Introduction

1.1. Research Background

Mobile commerce, or M‑commerce, is a concept that involves different applications, new technologies and services which are accessible from Internet enabled Mobile devices. The concept of M‑commerce has emerged from the traditional E‑commerce, any business transaction whose price or essential terms were negotiated over an online system such as an Internet, Extranet, Electronic Data Interchange network, or electronic mail system. M-commerce is one kind of business operation in which the buying and selling of goods and services through wireless handheld devices such as cell phones and personal digital assistants (PDAs). Through the use of M-commerce technology, business can be conducted electronically from anywhere at any time.

Following the E-Commerce era, according to Barnes (2002), M-commerce is considered as the next big trend in technological evolvement due to the changing needs of consumers**.** Consumers today lead to an increasingly fast-paced life and demand smaller, better, faster, and more reliable wireless technology to keep up with their lifestyles. Therefore, with the ability of making traditional E-Commerce tasks available to be performed wirelessly through a cell phone or PDA, M-commerce is considered as the solution to this demand.

Offering new marketing channels to interact with customers is very important to increase sales for companies. In order to market a product or service to the potential customers, one of the new and important direct marketing and selling channels is a new
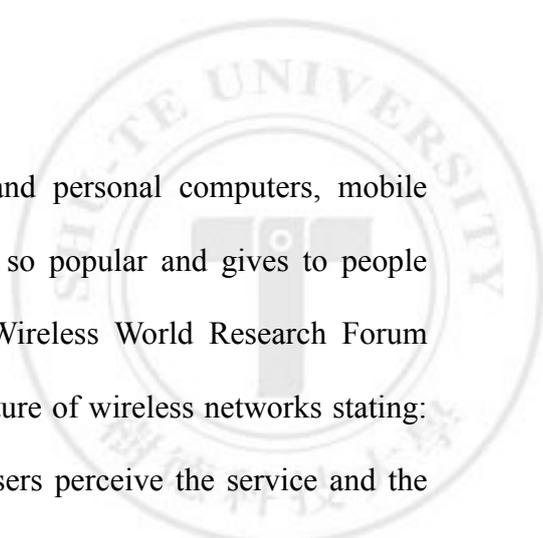
generation mobile phone system. Besides Internet and personal computers, mobile phone is very important for marketers, because it is so popular and gives to people mobility now. For instance, in October 2000, The Wireless World Research Forum (WWRF) presented their "Book of Visions" on the future of wireless networks stating: "It will become more and more important how the users perceive the service and the emotional impact and pleasure that the service creates and maintains" (WWRF, 2000). Advances in wireless technology have increased the number of people using mobile devices and accelerated the rapid development of M-commerce conducted with these devices.

Since the mid-1990s, the penetration of mobile phones in developed economies has been explosive. Whereas in 1997 only 215 million people were using mobile communication devices worldwide, by 2001 this had grown to a massive 961 million, further growing to 1.16 billion by 2003. By 2004, over 90% of countries have mobile and nearly one in every six of the world's inhabitants has a mobile telephone. By year 2000, almost 100 countries have more mobile than fixed-lines telephone subscribers and this has become a global phenomenon today.

Today, Western Europe exhibits the highest penetration of mobile phones (79%), followed by North America (48%), and Asia (12%). In 2002, the total number of SMS messages sent globally totaled 670 billion and this figure is expected to rise to 2.6 trillion by 2007. Leading international brand manufacturers - such as BMW, McDonald's and Nike - have already launched campaigns using the mobile phone as a means of conveying commercial content to customers. Therefore, M-commerce has truly changed the way business is being done so much so that the traditional companies

are referred to as "brick- and- mortar companies" and classified as belonging to the old-economy, while the businesses leveraging the power of Internet are being classified as belonging to "New-economy".

M-commerce is the successor of today's PC-based, wired, e-commerce technology. The evolving success of mobile communication is transforming the e-commerce (wired environment) into M-commerce (wireless environment) and the users of mobile devices (PDAs, smart phones etc.) are considered as a large group of potential market. In July of 2003, a million of new consumers are expected to make video calls, watching live football and checking e-mail through their mobile smart phones (Aungst & Wilson, 2005). Mobile technologies have gained much attention with consumer oriented products and applications. Thus, mobile commerce can be expected to grow much more quickly than E-commerce in consumer markets, since the number of mobile phone users is more than Internet users.

Nowadays, M- commerce is being applied in more and more fields. From a business-to-consumer (B2C) perspective, some capabilities of mobile commerce include being able to pay for food from vending machines or being able to pay for parking meters wirelessly through a cell phone or PDA. Furthermore, tasks previously confined to E-Commerce channels, such as purchasing a book from the Internet or getting a restaurant recommendation, are becoming more readily available to consumers through their handheld devices. Mobile commerce not only opens up the possibilities for B2C to be conducted wirelessly, but it also allows business-to-business (B2B) commerce to achieve greater efficiency. Instead of conducting face-to-face meetings or video conferences, employees can receive information from their managers through calls or

text messages to their cell phones. For example, through the use of notification and monitoring applications, shop floor workers can receive notifications if production specifications have changed, as well as respond when they have made the necessary changes.

1.2. Research Motivation

In the world, M- commerce in many European and Asian countries (e.g., Sweden, Japan) has been very popular. The emergence of the 3G, or third generation technology might be considered to be the key of success of mobile commerce in Japan and parts of Europe is their ability to introduce, respectively. For example, third-generation protocols support much higher data rates required for bandwidth-hungry applications such as full-motion video, pictures, games, location based services, television channels, or even full Internet access.

Furthermore, there are not many researchers studying about this problem in Vietnam to find out the effective way to push the Vietnamese customers' intention toward m- commerce using. By explaining usage intention from consumers' perspectives, we hope that the findings of this research will not only help M-commerce practitioners to develop better user accepted M-commerce systems, but also provide insights into how to promote new IT to potential customers. To fill those gaps, we decide to do this research to find out what factors affect the Vietnam consumers' intention to use the M- commerce.

Although Vietnam developed the Internet and E-Commerce 10 years ago and cell phone companies are upgrading networks to the 3G standard, providing adequate coverage in major metropolitan areas and providing consumers with content, most of

the users have not used mobile phone for commerce. The number of people who choose to adopt or use such technologies is still rather low in comparison with other countries, such as Hong Kong (95 percent) or in South Korea (93 percent). From this background, this research is studied with the objective to identify several factors impacting the adoption or acceptance of M-commerce technology in Vietnam.

1.3. Purposes and Research Questions

The purpose of this study is to find out the factors influencing the Vietnamese customers' behavior towards using mobile commerce in Vietnam today. To be able to achieve the stated purpose above, following research questions will be further investigated:

RQ1. What factors lessen or increase Vietnamese' intention towards M-commerce using?

RQ2. How does the proposed conceptual research model explain the variances of consumer's' M-commerce acceptance intention?

In order to answer the research questions, the study uses quantitative approach using Statistical Package for Social Sciences (SPSS) 13.0 to analysis the reliability and validity of our research, as well as to test the research model. The data was collected from 250 habitants, who were studying university and working in in Ho Chi Minh City during April, 2009

1.4. Structure of the Thesis

This study is divided into 5 chapters. By now the content of the first chapter has been presented. Consequently, the content of the following chapters will be briefly discussed below table 1, in which will be descriptive motivation of each chapter

generally. In the fourth chapter the empirical findings will be finally, and chapter five

contribution of this study is bought up under conclusions as well as implication for

management research.

Table1. Structure of the research

Chapter	Short description
1- Introduction	A brief introduction and importance of M-commerce in general, and in private in Vietnam context. The purposes of this research, the research background, research goals, and research question are also mentioned
2- Literature Review	In this part, we will discuss the researches available on M-commerce, as well as about the TAM, trust, self – efficacy.
3- Research Methods	In this part we will show our research model, research design, hypothesis, design instrument, pre-test study, and population of this research.
4- Research Results	After collecting data from questionnaire, we use statistic software to analysis the reliability and validity of our research.
5- Conclusions	In this part we will discuss about the results after using software to analysis and then basing on those results, we conduct conclusion to know whether our research hypothesis is supported or not; as well as suggest practical implications. In this part, we will also point out the limitations of this research in this part. Then give the dimensions for future researches.

Chapter 2   Literature Reviews

2.1. E- Commerce

Electronic Commerce is often referred to as "E-Commerce" or "eCommerce", which has been found much more attention in the literature than Electronic Business, owing to its proximity to the consumer. Accordingly, there are many definitions of Electronic Commerce in circulation, with each one emphasizing some different aspects of Electronic Commerce.

A very simple definition is delivered by Kalakota and Robinson: "E-Commerce is simply the buying and selling of products and services over the Web". E-commerce has revolutionized traditional commerce and boosted sales and exchanges of merchandise and information, with the introduction of the World Wide Web (Lee, Kou & Hu, 2004). E-commerce had begun to change the ways of thinking as well having give new venues for doing business (Timmers, 2000). Meanwhile, according Aldin, Brehmer & Johansson(2000), E-commerce is defined as any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact, although McIvor, Paul & Huang (2000) stated that the ecommerce is considered as a process of doing business electronically which involves automation of various business-to-business (B2B) and business-to-consumer (B2C) transaction. Electronic commerce includes the handling of transactions and different transfers over the net, it also includes the buying and selling of products, services and electronic information. From the beginning, e-commerce was used as a form of transaction between business enterprises, banks and other large financial institutions, but now the use of the internet is a part of the daily life of an individual consumer. Moreover, the
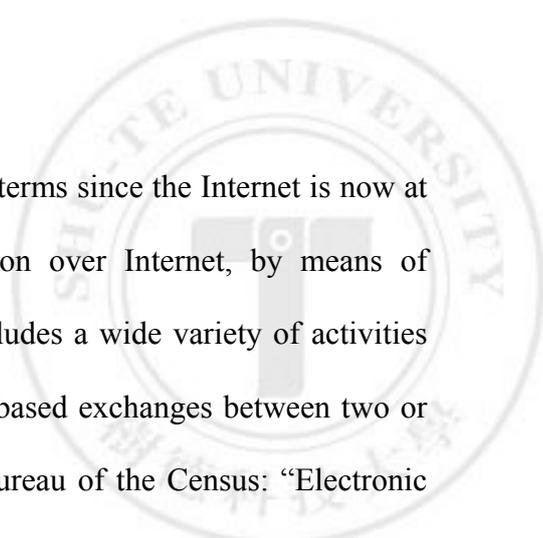
approach of e-commerce should be defined in a broad terms since the Internet is now at the forefront of discussion relating to the transaction over Internet, by means of computers and telecommunications networks; and includes a wide variety of activities involving the exchange of information, data or value-based exchanges between two or more parties (Kao & Decou, 2003). According US Bureau of the Census: "Electronic commerce is any transaction completed over a computer-mediated network that involves the transfer of ownership or rights to use goods or services. Completed transactions may have a zero price (e.g., a free software download)."(Mesenbourg, 2001)

E-commerce technologies such as the Internet have been most prevalent in business arena and the greatest potential of e-commerce application lies through the suitable business transaction (McIvor, Paul & Huang, 2000). Thus, adopting e-commerce in the business environment is considered advantageous which subsequently lead to the development of an e-commerce model (Kao & Decou, 2003). Furthermore, E-commerce has attracted significant attention to the infrastructure of burgeoning demands of real-time business. This high profile attention has resulted in significant progress towards strategies, requirements, and development of e-commerce applications (Varshney, Malloy & Snow, 2002). Consequently, Electronic commerce brings opportunities for commercial activities on the internet. It makes it easier for different groups such as different departments or companies designing and building new products or offering different services to their consumers. In addition, it also creates the easy and convenient for consumers to execute transactions daily.

2.2. Background of M-commerce
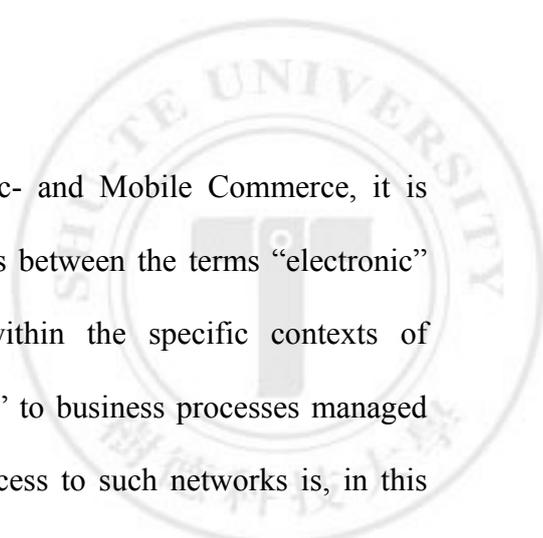
To understand the difference between Electronic- and Mobile Commerce, it is essential to understand the similarities and differences between the terms "electronic" and "mobile". The adjective "electronic", used within the specific contexts of "Electronic Commerce", signifies an "anytime access" to business processes managed by computer-mediated networks. Furthermore, the access to such networks is, in this case, stationary. The services are, therefore, not available independent of the geographic location (Hohenberg, Rufera, 2004). The adjective "mobile", used within the specific contexts of "Mobile Commerce", signifies an "anytime and anywhere access" to business processes managed by computer-mediated networks. The access takes place using mobile communication networks, making the availment of these services independent of the geographic location of the user (Stanoevska-Slabeva, 2003; Hohenberg, Rufera, 2004). Moreover, the difference between M-commerce and e-commerce is that with M-commerce, you eliminate the need of accessing a computer; moreover mobile devices possess smaller display screens, so you can contact them anywhere and anytime. There are two aspects to M-commerce that indicates that it is the new way of using a mobile device. One aspect of M-commerce offers the user a wide range of new services. The second aspect of M-commerce that need to be addressed is that it is a new distribution channel for existing products and service such as purchasing cinema tickets, buying stocks or making bank transactions and so on.

Mobile Commerce is also known as Mobile Electronic Commerce (Zhang et al., 2003). In other words, Mobile Commerce transactions are basically electronic transactions conducted using a mobile terminal and a wireless network. Mobile terminals include all portable devices such as mobile telephones and PDAs, as well as
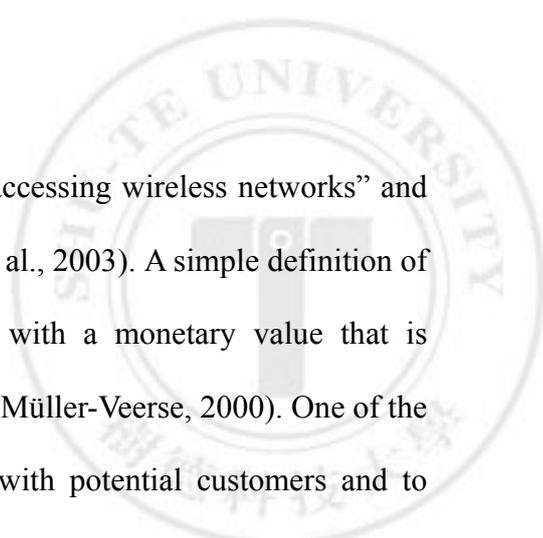
devices "mounted in the vehicles that are capable of accessing wireless networks" and perform Mobile Commerce transactions (Veijalainen et al., 2003). A simple definition of Mobile Commerce describes it as "any transaction with a monetary value that is conducted via a mobile telecommunications network" (Müller-Veerse, 2000). One of the marketers demands is to be able to communicate with potential customers and to contact them anywhere and anytime. Mobile phone made a revolutionary contribution to fulfilling the anywhere and anytime connectivity marketers' wishes. Furthermore, Yuan and Cheng (2004) emphasize that mobile marketing is getting increasingly popular because mobile phone is a personal device used in marketing. Meanwhile, Scharl et al., (2005) define mobile marketing as using a wireless medium to provide consumers with time- and location-sensitive, personalized information that promotes products, services and ideas, thereby benefiting all stakeholders. Shortly, mobile marketing refers to marketing activities and programs performed via mobile phone in mobile commerce

According to Norman Sadeh, M-commerce is defined as "any transaction with a monetary value that is conducted via a mobile telecommunications network". The technology behind M-commerce is very similar to the one behind e-commerce. The original idea with M-commerce was to make e-commerce easier, which is referred to as fixed internet application. M-commerce could also be considered as the rising set of functions and services people can access from their Internet enabled mobile devices. These definitions suggest that there are many dimensions to mobile commerce. M-commerce is a concept which is hard to define since there are many different definitions for it, and there are constantly new definitions arising with time. In addition,
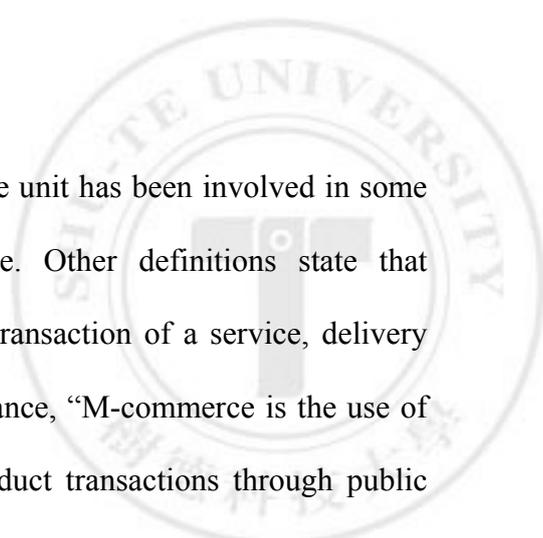
the widest definition of M-commerce is when a mobile unit has been involved in some sort of decision process when making a purchase. Other definitions state that M-commerce only occurs when the whole purchase transaction of a service, delivery and payment is done though the mobile unit. For instance, "M-commerce is the use of mobile (hand-held) devices to communicate and conduct transactions through public and private networks" (Balasubramanian et al., 2002), or "M-commerce is the buying and selling of goods and services, using wireless hand-held devices such as mobile telephones or personal data assistants (PDAs)." According Shahidul et al., (2006), Mobile Commerce is any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and completed by using mobile access to computer-mediated networks with the help of an electronic device. M-commerce has come forward to become the hottest new trend in business transactions (Lee, Kou & Hu, 2004).

M-commerce is an emerging discipline involving applications, mobile devices, and middleware and wireless networks. While most of existing e-commerce applications can be modified to run in wireless environment, M-commerce also involves many more new applications that become possible only due to the wireless infrastructure (Varshney, Malloy & Snow, 2002). It is a rapidly evolving arena, both strategically and technologically (Stoica, 2001). M-commerce is considered as an effective way of delivering e-commerce to consumers regardless the time and location. To gain the advantages of M-commerce, companies have begun to offer M-commerce options for their consumers in addition to the e-commerce they already provide (Lee, Kou & Hu, 2004). In its present state, M-commerce can be viewed as an extension of conventional,
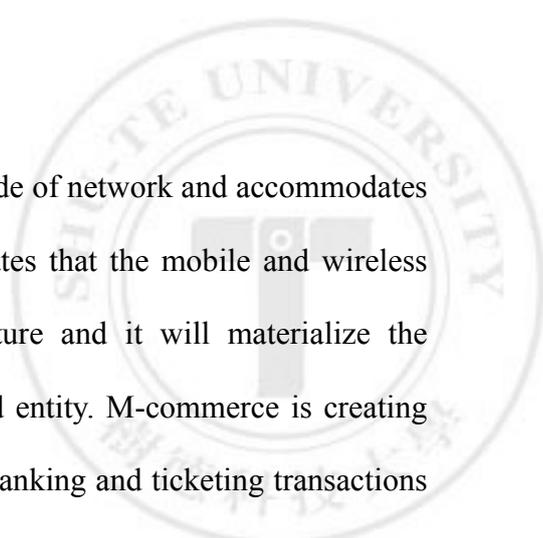
Internet based E-commerce, which adds a different mode of network and accommodates different end users' characteristics. The prediction states that the mobile and wireless system will control the Internet industry in the future and it will materialize the e-commerce and M-commerce into a singular blended entity. M-commerce is creating entirely new service opportunities such as payments, banking and ticketing transactions through wireless device. Secure payment and ease of use are key features of M-commerce, along with immediacy, personalization, and location awareness (Nokia, 2005).

According to Kalakota (2001) mobile infrastructure and devices, applications and experiences, and relationships and supply chains are the unique evident for M-commerce success. Considering the promising success of M-commerce many companies are implementing and developing their Internet facilitated E-commerce activities; since a new wave of technology-driven has innovated. This innovative technology has brought the progress in wireless technology and the numbers of mobile devices are expected to increase rapidly (Baumöl et al., 2003). There is a strong relationship between sellers, buyers, logistic providers, mobile network operators as well as payment operators. With new technology, M-commerce will soon be a part of everyday life, consumers carry them every day, everywhere, and mobile phones are almost always on (Yuan and Cheng, 2004). It promises to provide information anywhere and anytime. Once the technologies have been developed, they will be easily available and no longer considered a luxury. Like the Internet, it promises to enhance the interaction between the business and the consumer while simultaneously making it easier. Therefore, mobile commerce has attracted growing attention over the last few

years and continued to revolutionize marketplaces by introducing new business models as well as offering some advantages to customers, which are as following presented.

2.2.1. Mobile Payments

Mobile payments are expected to become one of the most important applications in M-commerce (Mallat *et. al,* 2004). M-commerce involves m-payment, which is defined as the process of two parties exchanging financial value using a mobile device in return for goods or services (Nambiar & Lu, 2005). Varshney (2003), stated that mobile payments can be divided into macro (more than $10) and micro-payments (less than or equal to $10). Therefore, a widespread use of mobile phone has emerged a number of payment schemes which allow the payment or goods/services from the mobile device (Nambiar & Lu, 2005).

2.2.2. Mobile Banking

Mobile banking services are valued by users because of the inherent time and place independence, and the overall effort-saving qualities. Mobile banking services enable users to receive information on their account balances via SMS. The new WAP and Java enabled mobile phones using General Packet Radio Service (GPRS) support a wider variety of banking services such as fund transfers between accounts, stock trading, and confirmation of direct payments via the phone's micro browser. The mobile services are typically modified versions of the Internet banking services of the particular bank and the architectures are backed by several banking industry consortiums.   Customers can use WAP over GPRS to track their account and credit card transactions and transfer funds between accounts. Furthermore, they can pay bills and trade equities using a menu-based

interface (Mallat et al., 2004).

2.2.3. Mobile Advertising

Mobile advertising is a very important class of M-commerce; it augments location information with personalization and delivers the obtained history of user's purchases habits. Advertising on mobile devices has large potential due to the very personal and intimate nature of the devices and high targeting possibilities (Göthlin et al., 2004). By keeping track of user's purchasing habits and current location, a targeted advertising campaign can be performed. Messages can be sent to all users who are currently in a certain area (identified by advertisers or even by users) or to certain users in all locations. Depending on interests and personality types of individual users, advertisers could decide whether a "push" or "pull" form of advertising is more suitable (Varshney, 2003). Most users do not mind being pushed for mobile location-aware services information, as long as they really needed the information. (Göthlin et al, 2004). It has been demonstrated in several trials that mobile users are willing to receive advertising messages with incentives (Varshney, 2003).

2.2.4. Mobile Gaming

Mobile devices offer the opportunity to play games nearly everywhere. Moreover, networked games allow individual players to interact with other people and to participate in a larger gaming world, which also provides for new business opportunities (Schaller *et al*., 2004). Advances in mobile computing and wireless communication technology enable the creation of games with appealing graphics and game play on a variety of mobile devices ranging from smart-phones to PDA's
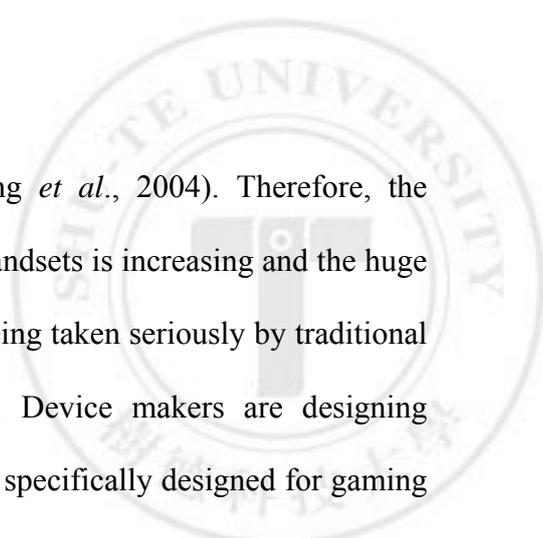
and other portable computing devices (Stichling *et al*., 2004). Therefore, the popularity of mobile games played on portable handsets is increasing and the huge possibilities for growth in this area are already being taken seriously by traditional "mobile telecommunications" handset vendors. Device makers are designing GSM handsets with hardware and user interfaces specifically designed for gaming as exemplified by Nokia with their recent N-gage device. In essence these new devices offer players the ability to play head to head with their friends or any other players at any time and in any place (McCaffery & Finney, 2004).

2.2.5. Mobile Music

A key advantage of mobile music is having user's phone and music player in the same small device. Nokia has developed many mobile phones with integrated technologies to play music, either from a digital music player or an FM stereo radio. A user can hear Stereo FM radio, tune in to visual radio to see the screen of mobile device, listen music as well as to download digital music tracks in AAC format. Instead of carrying a MP3 player a user can carry a mobile phone as a substitute (Nokia, 2005). According to the Nokia Vice President Ilkka Raiskinen (2002), mobile music will be an important area of digital services for customer convenience and their convenience is considered as a key. Elisa Communications and Nokia have together developed a mobile music service for mobile device users in Finland, where they can purchase digital music in a protected file format. The music bought from the online music store is downloaded to the user's computer and then transferred to the device (Nokia, 2002).

2.2.6. Mobile Video
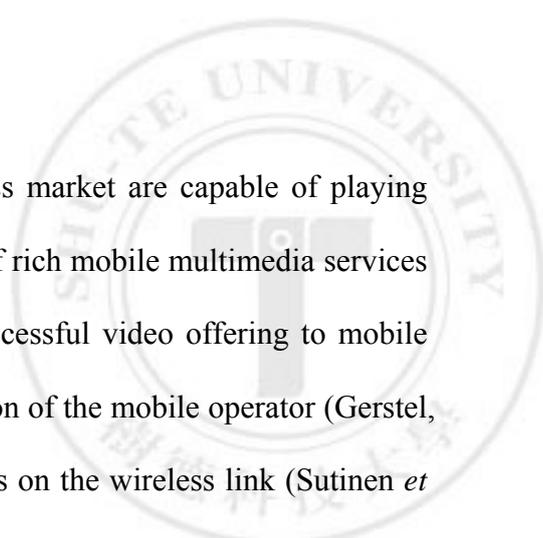
The advanced smartphones entering the mass market are capable of playing video files, which paves the way for new types of rich mobile multimedia services for users (Sutinen *et al*., 2004). Providing a successful video offering to mobile devices requires coordination with and cooperation of the mobile operator (Gerstel, 2005), because of the high data rate requirements on the wireless link (Sutinen *et al*., 2004). Most of today's video services are developed in conjunction with the operator, who in turn helps to market the service to customers. That marketing can bring in hundreds of thousands of potential users, quickly raising the need to have an appropriately scaled serving infrastructure (Gerstel, 2005).

2.2.7. Mobile Shopping

Mobile extends users ability to make transactions across time and location and creates new transaction opportunities. It is important to note that only a part of the purchasing process is conducted with the mobile terminal. The basic point is that user needs to know what he/she wants in advance of making a mobile purchase. Moving forward, it seems most likely that a shopping list might be created with a web interface, which may then be executed from a mobile. At the current stage of technological development the customer must ideally be faced with a one-button purchase experience for mobile shopping. The purchase suggestions will often be based on the users past behavior patterns (Müller- Veerse, 1999).

2.2.8. Mobile Retailing

Mobile retailing is an interesting M-commerce application to use a smartphone to order pizza from a delivery service; this might be even more appealing than ordering the pizza via internet, because it takes a long time to boot the PC or a PC
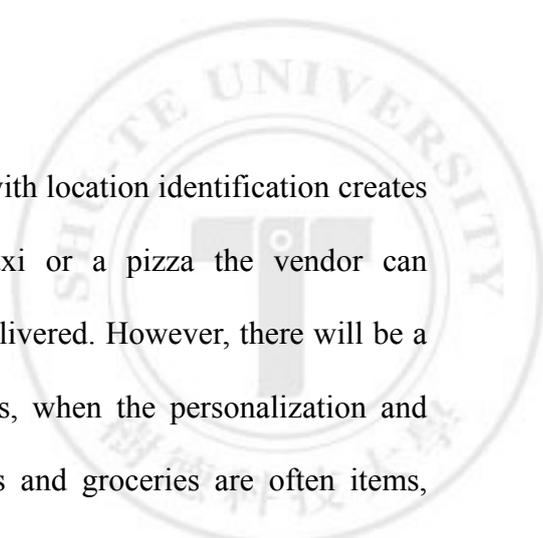
might not be available. M-commerce combined with location identification creates new value, for example, when ordering a taxi or a pizza the vendor can automatically know where the service is to be delivered. However, there will be a large space for e-retailers to become m-retailers, when the personalization and location issues are well addressed. Books, CDs and groceries are often items, which the user knows well and where he needs just a tool to make a purchase. The purchase will be made when the user has spare time, independently of the shop opening hours and physical location. (ibid)

2.2.9. Mobile Ticketing

Mobile electronic purchase or reservation of tickets is one of the most compelling proposed services, because ticket reservation/purchasing is hardly a pleasant expertise today. Either one has to go in person to a ticket booth, or has to call an agency or the outlet. Calling outside opening hour means having to go through a lengthy IVR (Intelligent Voice Response) system. It is clearly more convenient to select and book tickets for movies, theatres, opera and concerts directly from the mobile device, because often the decision to purchase is made while outside or on the move among friends (Müller-Veerse, 1999). This is one of the first WAP applications being seen in various markets. The travel market and especially the frequent business traveler market is likely to be an early WAP growth market. Using a WAP handset, train, plane, bus and boat tickets could be booked in a similar manner to movie tickets. The argument goes that M-commerce will be the driver of market growth in this arena, rather than a phenomenon, which lags behind wire line commerce growth.

2.3. M-commerce technologies

The WLAN technology is employed for wireless communication with Local Area Networks (LAN) and theoretically provides data transfer, which is much higher than UMTS [Krishnamurthy/Pahlavan, 2002]. In practice, WLAN permits data transfer with a speed of up to 2 mbps (Swisscom, 2004). Most of the WLAN systems are based on the standard developed by the US based Institute of Electrical and Electronics Engineers (IEEE) and work on the free-to-use, unlicensed 2.4 GHz frequency. The interface to mobile devices, e.g. laptops, is provided by Access Points (popularly known as Hotspots), which are connected to LAN. WLAN usually has a range of 100 metres in buildings and up to 300 metres on open ground. WLAN has gained tremendous popularity in past few years.

Bluetooth is basically a cable-replacement technology, intended to simplify the communication amongst and between mobile devices and personal computers (PC) (GSM Bluetooth, 2005). Bluetooth was role as a useful tool for Mobile Commerce, serving for diverse business needs such as mobile payment and direct marketing (Incisor, 2004). The main reasons for successful are (Ericsson Glossary, 2004):

- Bluetooth makes it possible to create temporary (ad-hoc) networks;

- It facilitates both voice- and data communication;

- It can communicate with any other device having Bluetooth;

- It helps synchronies data from different devices (e.g. transfer music and video files from mobile phone to PC or vice versa). It is a low-cost, short-range radio technology that can be used in a radius of about 10 metres, in some cases up to 100 metres. Bluetooth can transmit data with a speed of 432.6 kbps in case of synchronous

and up to 724 kbps in case of asynchronous data links.43 A Bluetooth device changes its broadcasting frequency   up to 1,600 times per second to provide better security while transmitting data (Ahlke, 2002). It is, thus, a high speed, secure and yet low-cost as well as low energy-consuming technology and for this reason highly suitable for mobile devices, in spite of range limitations.

The WAP is a communication standard that enables portable electronic devices to receive and interpret data. Public access to the Internet commenced in 1990 but the WAP commenced in 1997 (Fenech, 2000). In 1999, a variety of WAP enabled products were released and made numerous opportunities in communication system (Steenderen, 2002). WAP is one of the key enabling technologies of M-commerce as it allows mobile users to access the Internet from a mobile device. It is specifically designed for the mobile user, and takes full advantage of distinctive characteristics (James et al., 2002).

The objective of developing WAP was to provide an industry-wide specification for developing applications that operate on mobile telecommunications network and transmit Internet contents on mobile devices independent of the transmission technology used by network carriers (WAP-Forum, 2001).

As the 3G services are just beginning to reach users, 4G is a distant scenario expected to be launched in year 2010, notwithstanding announcements by individual firms, e.g. NTT, to pre-pone 4G to year 2006 (Dholakia et al., 2004). Nevertheless principal trends of 4G are expected to go along following lines:

▪ A seamless roaming between 2.5G, 3G and WLAN may be achieved so that mobile devices will automatically detect the presence of a network with higher bandwidth and switch to it.
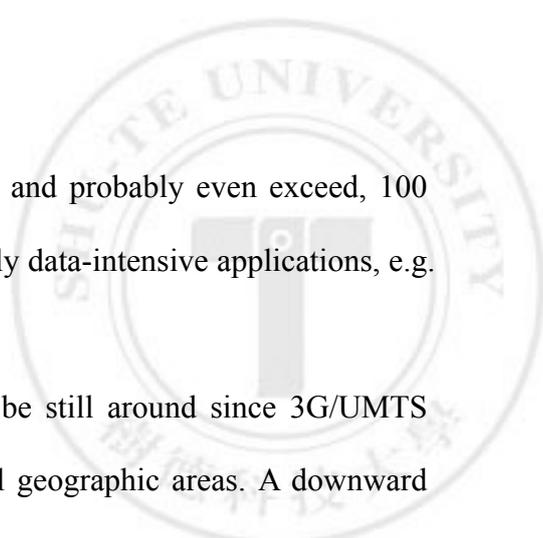
- Speed of data transfer is expected to reach, and probably even exceed, 100 mbps [EITO, 2004]. This would allow offering of highly data-intensive applications, e.g. live video streaming.

- 2G and 2.5G technologies are expected to be still around since 3G/UMTS networks are not expected to extend their reach to all geographic areas. A downward compatibility of mobile devices would have to be ensured (Dholakia et al., 2004).

2.4. Mobile Phone Users' Attitudes towards Mobile Commerce

In order to successfully market products and services via mobile phone, marketers and retailers must understand mobile phone users' attitudes, perceptions, characteristics, and shopping patterns. Tsang et al. (2004) investigated consumer attitudes toward mobile advertising and the relationship between attitude and behavior. The results of their survey indicate that consumers generally have negative attitudes toward mobile advertising unless they have specifically consented to receive the advertising messages.

Consumer behavior is an important aspect from several points of view. In a marketing perspective knowing the consumer behavior is important in order to facilitate the promotional activities so that the consumer can be aware of their product choices as well as brand preferences. Consumers also need to gain insight into their own behavior if they are to spend their income optimally. The study of consumer behavior is considered as one of the rich domain from science perspective, in which to test economic, cognitive, economic–psychological and social–psychological theories (Antonides & Van Raaij, 1998). Moreover, consumer behavior on the Internet is said to be increasingly important since shopping has begun to penetrate the mass market

(Rowley, 2000), in which the consumers buying behavior is a predominant approach for marketing area, it explains the fundamentals of consumer behavior, describes the consumer buying process as learning, information-processing and decision-making activity (Constantinides, 2004). As a result, there are numerous theories, models, and concepts in consumer behavior field, but the consumer decision making process is one of the most important theories to understand (Peter & Donnelly, 2000).

2.5. E-Commerce and M-commerce in Vietnam

Following stable and rapid economic development of the 2001-2005 period, Vietnam economy in 2006 continued its high-rate growth with an 8.17% increase in GDP.1 Trade maintained vigorous growth. For foreign trade, export turnover totaled USD 39.6 billion, import turnover reached USD 44 billion, corresponding to a 22.1% and 20.1% increase, respectively, as compared with year 2005. For domestic trade, total value of product and service retail reached 523,500 billion VND, 20.9% higher than that of year 2005. This socioeconomic setting has created favorable conditions for e-commerce development.

In Vietnam, PDAs and cellular phones have become so popular that many businesses are beginning to use M-commerce as a more efficient method of reaching and communicating with their customers. Although technological trends and advances are concentrated in Asia and in Europe, Canada and the United States are also beginning to experiment with early-stage M-commerce.

By September, 2007 there has been over 190 networks of 3G established in 50 countries. 3G has 6 standards: W-CDMA, CDMA2000, TD-CDMA / TD-SCDMA, UWC, DECT and Mobile WiMAX which are the standard connection for mobile
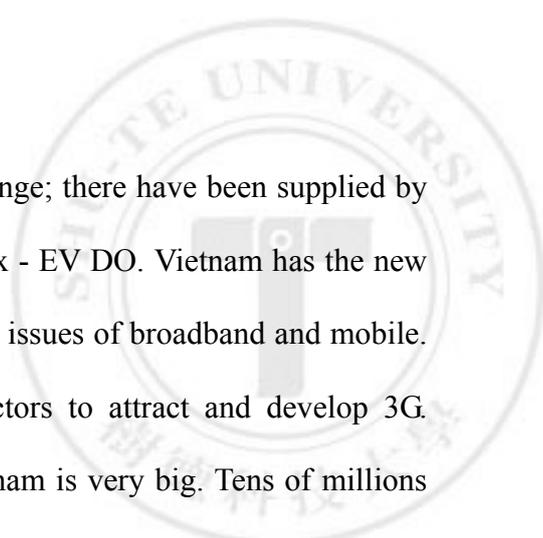
commerce. In Vietnam, 3G technology is not very strange; there have been supplied by EVN Telecom and Sfone with standard CDMA 20001x - EV DO. Vietnam has the new license for standard 3G (W-CDMA) to resolve the two issues of broadband and mobile. In Vietnam, price and quality is one of the key factors to attract and develop 3G. Therefore, potential to provide 3G technology in Vietnam is very big. Tens of millions of people using the mobile device will access Internet with high speed, such as these following multimedia services: listening to music, watching online movies, downloading music, movies, mobile TV and transmission data up to 2 Mbit/s. M-commerce will provide several services: view information on ticket purchase and train fire, the aircraft, view and hotel reservations, view useful information such as lottery results, the tour. Moreover, m- commerce can give the user devices to be able to capture all information necessary and interesting in life such as daily news, information, weather, lottery results, and the entertainment as wallpaper, ring tones and games and so on. It has become familiar to consumers, especially young people in Vietnam. Thus, through M-commerce, customers can trade transactions anytime, anywhere with very simple and completely reliable operation. For service providers, M-commerce will bring the new business opportunities, improving service quality; especially M-commerce will source clients with high quality for supplier's level. As to limitations on M-commerce in Vietnam, a report said: "At present, infrastructure payment is not focused and lack of links is one of the reasons why trading M-commerce in Vietnam is very restrictive. M-commerce just stops at providing information and transferring money through SMS, or prepaid cards".

At present, there were more than 10 million mobile subscribers including prepaid

and post paid ones, most of whom were high-income or young people who were sensitive with new technologies. In comparison with the number of Internet users, the number of mobile users was so potential for e-commerce application in general and in particular for mobile solutions in near future.

In 4/2006, a mATM services were offi cially introduced at seminar titled "Information Technology Overview of Vietnam in 2006" and "Vietnam Computer Electronic World Expo 2006" exhibition. mATM services were based on the cooperation between Minh Viet International Company, Asia Commercial Bank (ACB), Vinaphone and eMobile – a mobile solutions provider from Singapore. With mATM service, clients of ACB using Vinaphone (regardless prepaid or post paid) can check account by mobile phone, debit account for payment, and withdraw money from account at retail points, or buy online or offl ine services accepting payment by mATM. Retailer can even perform electronic money transferring and receiving services despite their customers have accounts opened at the bank or not.

On 8/1/2006, Evina Trading Company offi cially opened an online buying and selling system and mobile payment system at www.mbay.com.vn. This was a place where individuals, organizations and enterprises can freely buy and sell products and services. In addition, mBay also off ered collecting service through SMS mobile payment technology for members of mBay.

The above two models of mobile payment was still at the initial stage of development. The effectiveness and application level has not been defined. However, mATM and mBay put a very first step to M-commerce realization and contributed to diversify the payment solutions for e-commerce in Vietnam.

2.6. TAM

2.6.1. Development of TAM

Davis (1989) proposed Technology Acceptance Model (TAM) to address why users accept or reject information technology. Up to now, TAM has received a great amount of attention; according to the statistic, more than 150 relevant articles using TAM have been published in the last two decades.

The Technology Acceptance Model (TAM) was first proposed by Davis in 1989 based on the theory of reasonable action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). TAM is intended to provide a conceptual model featuring a theoretic foundation and parsimony, to explain and predict the behavioral intention and practical behaviors of information technology users, based on the acceptance and use of information technology. Based on the suggestions of previous studies, Davis (1989) and Davis et al. (1989) presented two factors that determine user's acceptance or rejection of information technology, namely perceived usefulness and perceived ease of use. Users who perceive higher ease of use of a certain system think the system is easier to use, generating a positive attitude towards the adoption of the system. Moreover, perceived ease of use can strengthen perceived usefulness, while attitude and perceived usefulness have significantly positive effects on behavioral intention. Similar to the TRA, TAM suggests that antecedents that directly affect perceived usefulness and perceived ease of use, such as user's personal attribute, system feature, and environmental variable, can be covered by an external variable. TAM has been used to predict users' intention to accept or adopt a variety of
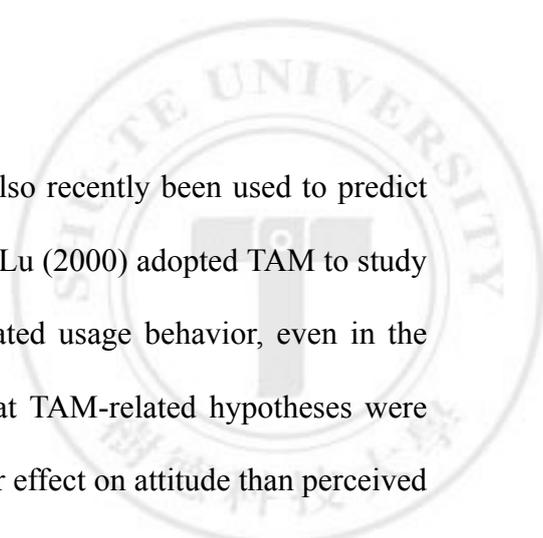
technologies and information systems, and has also recently been used to predict internet and mobile commerce adoption. Lin and Lu (2000) adopted TAM to study website usage, and found that TAM fully mediated usage behavior, even in the internet environment. Their findings indicate that TAM-related hypotheses were all supported: perceived ease of use has a stronger effect on attitude than perceived usefulness. Heijden et al. (2003) explored factors that influence consumer's intentions mobile commerce. Yang (2005) adopted TAM to study factors affecting Singaporeans' attitudes toward mobile commerce. Luarn and Lin (2005) extended the applicability of the TAM to the context of mobile banking; their findings strongly supported the extended TAM in predicting users' intentions to adopt mobile banking. Wu and Wang (2005) findings indicated that all variables except perceived ease of use significantly affect users' behavioral intention. Their research indicated that perceived usefulness, perceived ease of use are positively related to attitude. They also found that attitude is the most important factor on behavior intention for 3G services, followed by perceived ease of use and perceived usefulness. The direct effect of perceived usefulness on intention is not significant, but its indirect effect through attitude on intention is significant. The basic TAM explains and predicts user intention and usage by only two main constructs, perceived usefulness and perceived ease of use.

Adoption of end-user services in mobile commerce may be treated as technology adoption. Several perspectives have been applied to understanding technology adoption from the individual end-user perspective. Among these is the TAM model of Davis (1989, 1993). In the TAM model, usefulness and ease of use
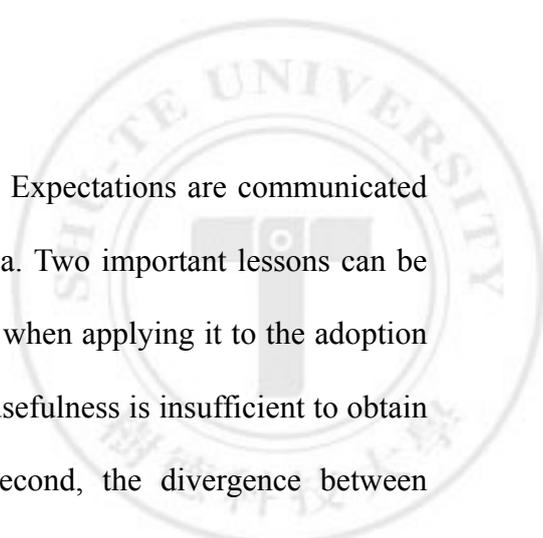
affect users' attitudes towards mobile commerce. Expectations are communicated both through other users and through mass media. Two important lessons can be learned from prior studies using the TAM model when applying it to the adoption of mobile commerce. First, merely instrumental usefulness is insufficient to obtain widespread adoption of end- user services. Second, the divergence between communicated expectations and user perceptions may seriously affect end-users' long term attitudes towards these services and delay individual end-user adoption.

2.6.2. Component of TAM

2.6.2.1. Perceived usefulness

Perceived usefulness (PU) is defined as the extent to which a person believes that using a particular system will enhance his or her job performance. There is extensive research in the IS that provides evidence of the significant effect of perceived usefulness on usage intention (Davis et al, 1989, Venkatesh & Morris, 2000). An individual evaluates the consequences of their behavior in terms of perceived usefulness and base their choice of behavior on the desirability of the perceived usefulness. Therefore, perceived usefulness will influence their intention to accept and adopt mobile commerce, either directly or indirectly. TAM posited that PU not only affects intention to use indirectly through affecting attitude, but also affects intention to use directly. Davis (1989) defined PU as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context". Therefore, perceived usefulness in TAM model originally refers to job related productivity, performance, and effectiveness
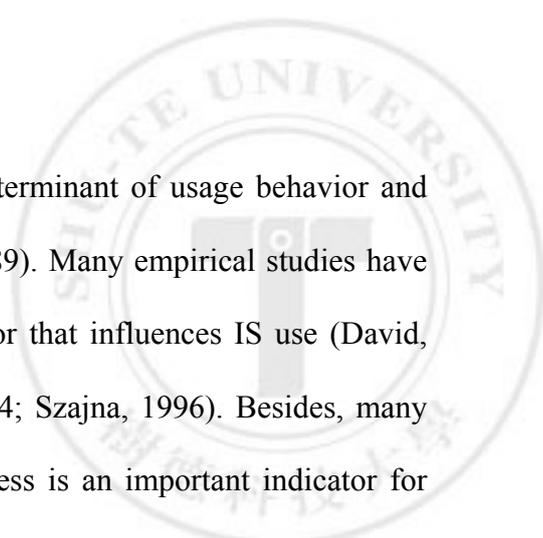
(Davis, 1989). PU was found as a major determinant of usage behavior and intention (Adams et al., 1992 and Davis, 1989). Many empirical studies have consistently identified PU as a primary factor that influences IS use (David, 1989; Straub et al., 1997; Subramanian, 1994; Szajna, 1996). Besides, many researches reaffirmed that perceived usefulness is an important indicator for the technology acceptance (Davis, 1993; Taylor & Todd, 1995; Chau, 1996; Jiang et al., 2000). O'cass and Fenench (2003) argue that TAM is appropriate for research areas in electronic commerce applications since electronic commerce is based on computer technology as scholars indicate that M-commerce is an extension of e-commerce.

2.6.2.2. Perceived ease of use

Perceived ease of use is an individual's assessment of the extent to which interaction with a specific information system or technology is free of mental effort. Perceived ease of use refers to the degree to which a user perceives that an IS easy to understand and use (Davis, 1989).The perceived ease of use for a system is defined as the degree to which an individual believes that using a particular technology will be free of effort. The results of many of the prior empirical studies have demonstrated that perceived ease of use has a positive correlation with behavioral intention, both directly (Davis, 1989; Gefen and Straub, 1997, 2000; Venkatesh, 2000; Venkatesh and Davis, 2000; Gefen, 2003). This construct is posited to influence behavioral intentions to use through two casual pathways: a direct effect as well as an indirect effect through perceived usefulness. A few empirical studies tested
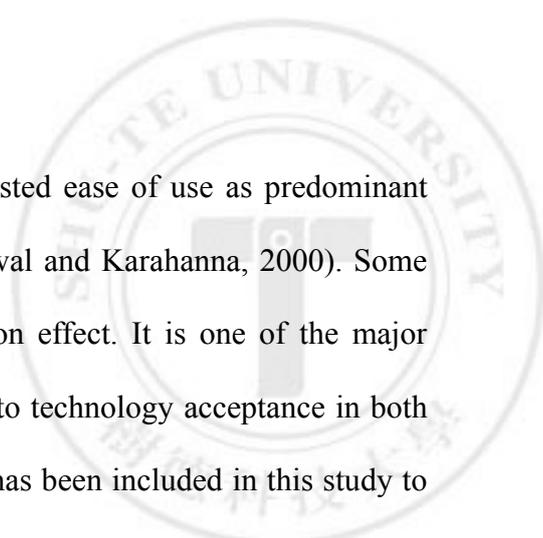
ease of use as a predominant determinant tested ease of use as predominant determinant of intention to adopt (e.g. Agarwal and Karahanna, 2000). Some found that this construct exerting a mediation effect. It is one of the major behavioral beliefs influencing user intention to technology acceptance in both original and the revised TAM models and it has been included in this study to determine this influence the mobile commerce intent as well. According Hong $ Tam, 2006, perceived ease of use has effect on behavioral intention in using mobile commerce.

2.6.2.3. Attitude (toward using Mobile commerce)

According to TAM theory, the actual usage of a specified system will be determined by an individual's intention to use, which is jointly determined by an individual's attitude towards using a system (Davis et al., 1989). The attitude is a psychological tendency expressed by evaluating a particular entity in terms of the degree of positive feelings about the technology. The Theory of Cognitive Dissonance developed by Festinger is one of the most important theoretical concepts in explaining the integration of a single attitude into an individual's attitudinal system (1978). The theory is based on the assumption that an individual is always aiming to keep his cognitive system in balance. If inconsistencies between several cognitions - i.e. opinions, attitudes, or expectations - arise, consumers experience a feeling of discomfort. One usable strategy is to reshape the attitude featuring the lowest resistance to become more consistent with the other attitudes of the system (Güttler, 2003). These considerations hold important implications for this study, as they allow us to

determine the relationship between the attitudes toward mobile commerce. Mobile commerce on the other hand is to be classified as an innovation.

2.6.2.4. Behavior Intention (toward using Mobile commerce)

In this study, intention towards the m- commerce adoption refers to the degree to which one believes that one will engage in using M-commerce (Davis et al., 1989). The TAM further postulates that behavioral intention (BI) to use a particular technology is determined by attitude and perceived usefulness. Past studies invariably show that the latter factor has a large impact on intention, either directly or indirectly via attitude. The level of behavioral intention, in turn, determines the likelihood that actual usage (AU) will occur (Ajzen and Fishbein, 1975; Davis et al., 1989). Intention to use is a measure of the likelihood that a person will adopt the application (Davis et al. 1989). Research on TRA and TAM has consistently found strong empirical support for these relationships: attitudes and intentions can accurately explain and predict actual behavior (Heijden, 2000). Several researches have proved the powerful correlation between intention to engage in a behavior and actual behavior (Lucas and Spitler, 1999; Dabholkar and Bagozzi, 2002; Vijayasarathy, 2004). However, to maintain instrument brevity, the research adopted behavioral intention as a surrogate for the emergence of behavioral intention and actual usage in the research model, and define it as an individual's intention to use mobile commerce

2.7. Perceived Trust

Consumer trust is recognized as one of the most important factors in the studies of
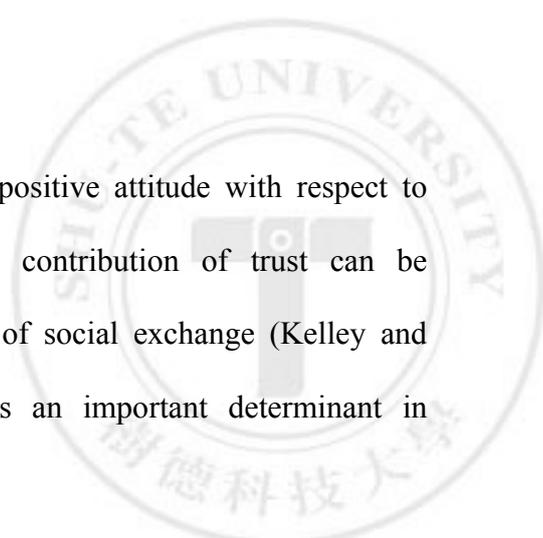
M-commerce. In other words, trust is an important positive attitude with respect to online purchasing behavior. The functionality and contribution of trust can be apparently identified from the economic framework of social exchange (Kelley and Thibaut, 1978; Kelley, 1979). Accordingly, trust is an important determinant in M-commerce including public services.

Previous studies had introduced the concept of "perceived risk". In fact, perceived risk is closely related to trust. In traditional IT adoption theories, research focused on the acceptance behavior of technical system itself. But trust is also reflected through their "trust" of the technology. Trust of technology is indirectly reflected on the belief of "utility". In case of M-commerce, user acceptance is not only the acceptance of technology but also the acceptance of M-commerce service providers. For example, following Siau & Shen classified trust into two categories: trust of technology and trust of M-commerce service providers. In addition, since M-commerce is still in its early development stage, many technical protocols, transaction standards, regulating policies, and payment systems need to be standardized. Therefore, trust is especially important for user acceptance. Earning user's trust is critical for M-commerce's success. It is necessary to introduce the concept of trust into M-commerce research, especially user's trust of M-commerce's service providers. Trust should be included in such concepts as usefulness and ease of use. There are rich literatures and theories on consumer's trust of suppliers and service providers. Among these literatures, Bhattacherjee provided the definition and measurement of the consumer's trust of an e-commerce service provider. The consumer's trust of an e-commerce service provider is determined by three beliefs: ability, integrity, and benevolence. Ability refers to the user's perception of provider's

"competencies and knowledge salient to the expected behavior."

Integrity refers to user's perception that the service providers "will adhere to a set of principles or rules of exchange" acceptable to the users during and after the exchange. Benevolence refers to the extent to which a service provider "is believed to intend doing well to the users, beyond its own profit motive". A number of studies suggest that the reason why many people have not yet shopped online is due to the lack of trust in online businesses (Clarke, 1999; Hoffman et al., 1996). Trust can be defined as feeling secure or insecure about relying on an entity. It has positive influence on the development of positive customer attitude, intention to purchase, and purchasing behaviors (Swan et al., 1999). For instance, Gefen et al. added "trust" as a construct to the TAM in the context of online shopping. In the context of online shopping, the influencing factors for consumers' lack of trust in virtual stores are found to be personal information privacy and data security concerns. According to a recent survey, privacy is the number one consumer issue facing the Internet (Benassi, 1999). According to one study, 42 per cent of respondents leave Websites when asked to give personal information due to privacy concerns (Greene, 1997). Besides, consumers' lack of trust is also partly due to their data security concerns. Information sent over the Internet travels through many unsecured computer systems, and it is at risk of interception and misuse. Many consumers are still hesitant about transmitting private information, especially financial information, over this open electronic network. Therefore, consumer trust can only be inspired if the risks associated with online purchases are reduced to a level that is tolerable to consumers. The reliability and security needed to cultivate online trust are equally important for M-commerce technology, especially in the early stages, since

disappointing performances of the wireless communication system will make customers suspicious of its ability to deliver on promises. As mobile technology evolves, focus will shift from engendering customer trust in technology to engendering trust in vendors.

Siau & Shen say that building customer trust in M-commerce is a continuous process, which extends from initial trust formation to continuous trust development, and with mobile technology and vendors as essential framework elements. In order to enhance trust in mobile technology, technical hurdles must be surmounted. Design improvements are needed on current mobile devices that enhance usability, enabling customers to perform business activities easily and effectively at no sacrifice to mobility and flexibility. Also, security must be designed into the system. Encryption, digital certificates, and private and public keys are among the measures that will help meet future security requirements in the mobile environment. Compared to mobile technology trust building, building trust in mobile vendors is more elusive and challenging.

The functionality and contribution of trust can be apparently identified from the economic framework of social exchange (Kelley and Thibaut, 1978; Kelley, 1979). Within social exchange, business transactions are usually carried out without explicit contract or control mechanism against opportunistic behavior so that the parties involved in these activities are not able to attain complete legal protection and expose themselves in a complicated social environment with mass uncertainty. To insure better rewards from the economic activities, people make efforts to reduce this social complexity and avoid risk from being exploited (Wrightsman, 1972). Trust is basically
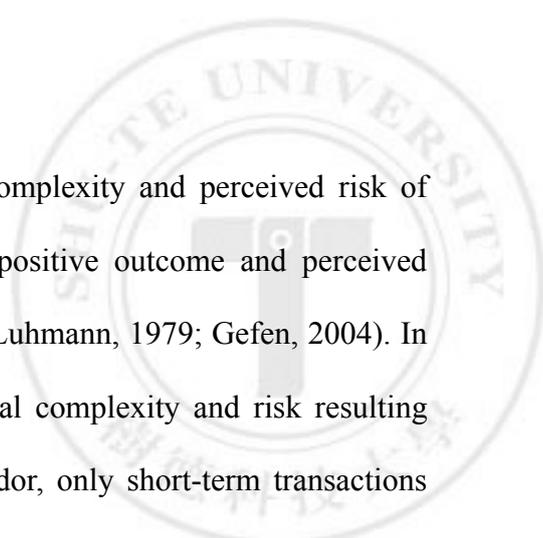
seen as a common mechanism for reducing social complexity and perceived risk of transaction through increasing the expectation of a positive outcome and perceived certainty regarding the expected behavior of trust ee (Luhmann, 1979; Gefen, 2004). In particular for on-line business, without reducing social complexity and risk resulting from the undesirable opportunistic behavior of e-vendor, only short-term transactions would be possible (Kim et al., 2004). Accordingly, trust is an important determinant in M-commerce including public services.

2.8. Perceived Self-Efficacy

Self-efficacy is a key concept in social cognitive theory (Bandura, 1977; 1982). Social cognitive theory presumes that people are neither driven only by inter forces, nor only by external stimuli. Instead, human behavior is explained via a model of triadic reciprocal. In this model inner forces of behavior, cognitive, personal factors and environmental events all operate interactively as determinants of each other. A key regulatory mechanism in this dynamic relationship that affects human behavior is self-efficacy.

The most influential of these cognitive structures, according to Bandura (1986), is self-efficacy, which is one's perceived capability to, "mobilize the motivation, cognitive resources, and courses of action necessary to exercise control over events in one's life" (Wood & Bandura, 1989). Besides, self-efficacy was thought to affect behavioral functioning by influencing people's choice activities, effort expenditure, and persistence in the face of difficulties (Schunk, 1981). Furthermore, he explains that it is the capacity to overcome challenges in order to succeed in life. Since self-efficacy construct is often some measure of task performance, self-efficacy has been employed by many IS
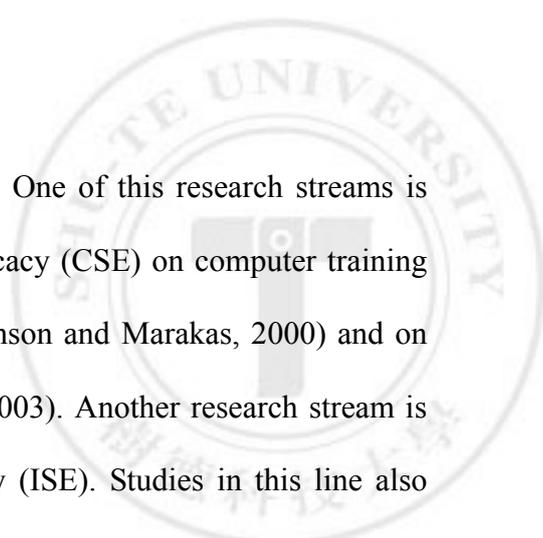
researchers and formed a variety of research streams. One of this research streams is focused on examining the effect of computer self-efficacy (CSE) on computer training performance (Compeau & Higgins, 1995b, 1999; Johnson and Marakas, 2000) and on IT usage (e.g., Easley et al., 2003; Venkatesh et al., 2003). Another research stream is concentrated on the construct of Internet self-efficacy (ISE). Studies in this line also address the significant relationship between ISE and Internet use (e.g., Hsu and Chiu, 2004; Lam and Lee, 2005). More recently, the concept of self-efficacy has been applied to knowledge management to validate the effect of personal efficacy belief in knowledge sharing, that is knowledge sharing self-efficacy which is said to be an important issue in knowledge sharing because complexity and knowledge barriers to the exchange of existing knowledge among members of vertical community. Prior research has confirmed the critical role that computer self-efficacy plays in understanding individual acceptance of IT (Agarwal, Sambamurthy and Stair; 2000). To Vietnamese, m- commerce is something quite new; thus, perceived self-efficacy of M-commerce will be an important knowledge resource for consumers in adopting M-commerce.

In general, prior research has suggested a positive relationship between experience with computing technology and a variety of outcomes, such as effects concerning computers and computer usage (Agarwal & Prasad, 1999; Harrison & Rainer, 1992; Levin & Gordon, 1989). A related construct, called computer self-efficacy, has been examined in IS literature (e.g., Compeau & Higgins, 1995; 1999). Continuing research efforts on computer self-efficacy can be observed in recent IS studies (Chau, 2001; Hong et al., 2001; Johnson & Marakas, 2000), which confirm the critical role that computer self-efficacy plays in understanding individual response to information

technology. Our study has focused on whether respondents believed they had the required knowledge, skill or ability to use mobile banking. Thus, perceived self-efficacy is defined as the judgment of one's ability to use mobile banking. The proposed relationship between perceived self-efficacy and perceived ease of use is based on the theoretical argument by Davis (1989) and Mathieson (1991).

The final and most proximate influence on an individual's cognitive interpretations of information technology is factors related to the individual. Although prior research has tested the influence of numerous individual factors on technology acceptance outcomes (e.g., Agarwal and Prasad 1999), the construct that have received consistent support as important predictors are computer self-efficacy with technology. Self-efficacy has its theoretical roots in Bandura's (1977) social cognitive theory, which posits that by watching others perform a behavior, an individual's perception of his own ability to perform the behavior, or self-efficacy, is influenced as well as the outcomes that he or she expects to occur. Bandura defines efficacy expectation as the conviction that one can successfully execute the behavior required to produce a desired outcome.

In subsequent work, IS researchers have found that self-efficacy tailored to a computer/ information technology context is an important determinant of a variety of user perceptions of technologies. For instance, in a study of the relative merits of different training approaches, Compeau and Higgins (1995) argued that self-efficacy influences outcome expectations, which they subsequently found to comprise of two distinct constructs: performance outcomes, including items very similar to those found in perceived usefulness, and personal outcomes, relating to an individual's expectations of an enhanced status within the organization (i.e., image.) Venkatesh and Davis (1996)

and Agarwal et al. (2000) posited and found empirical support for a significant relationship between general computer self-efficacy beliefs and perceptions about the ease of use of a specific technology.
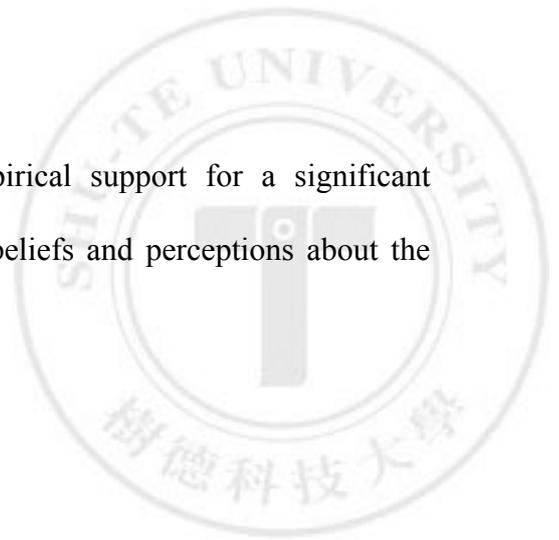
Chapter 3   Research Methods

3.1. Research Model and Hypothesis

3.1.1. Research Model

Based on above theoretical background, we come up our research model as following, 6 hypotheses with 6 constructs include perceived usefulness; perceived ease of use, perceived trust, perceived self-efficacy, attitude, and the last construct in our research is behavior intention to use Mobile commerce. In analyzing part of this research we will show how we used SPSS 13.0 to test the significant of whole model.

Figure1. The research model
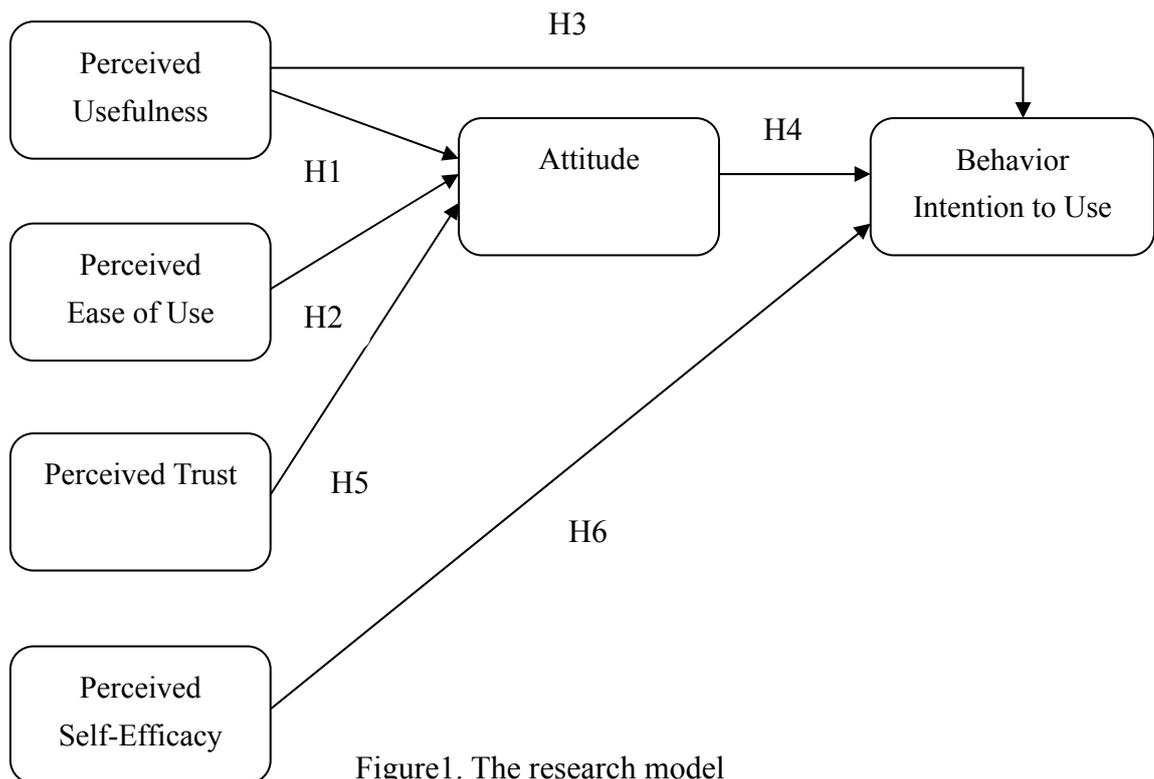
3.1.2. Research Hypothesis

Luarn & Lin (2005) have applied TAM to understand the behavioral intention to use mobile commerce. Perceived usefulness and perceived ease of use were

observed as the factors influencing behavioral intention. Song et al. (2007) developed a conceptual framework for investigating the role of the perceived ease of use in determining consumers' intention to use mobile commerce

Moreover, Liao et al. (2007) tested the hypothesized model, a revised version of the TAM, in order to elucidate customers' perceptions towards usage of 3G wireless network services in Taiwan. The purpose of their study is to investigate whether perceived usefulness, perceived ease of use have a positive influence on attitude, which, in turn, affects behavior intention, and the results suggested that perceived usefulness and perceived ease of use still play a major and important role in users' perceptions of systems and their outcomes. This research attempts to examine the user acceptance of mobile commerce based on an extended TAM. According to TAM has been successfully tested in various technology acceptance studies in different area (Cronan 1993; Szajna 1994; 1996; Taylor & Todd 1995) including the Internet, World Wide Web (Moon & Kim 2001), and electronic commerce (Fan and Kohli 2002; Gefen & Straub 2000). As such, it is suggested those following TAM's constructs consisting of perceived usefulness of a mobile learning, perceived ease of use of a mobile learning, and attitude toward using mobile learning should be included in a general conceptual model of mobile learning. Based on this, three following hypotheses are generated:

H1. PU will have a positive effect on attitude towards mobile commerce.

H2. PEOU will have a positive effect on attitude towards mobile commerce.

H3. PU will have a positive effect on intention towards using mobile

commerce.

According to TAM theory, the actual usage of a specified system will be determined by an individual's intention to sue, which is jointly determined by an individual's attitude towards using a system (Davis et al., 1989). Attitude in this research is hypothesized to mediate the influences of the one beliefs, trust on the intention towards using mobile commerce. Accordingly, the hypothesis is posited that:

H4. Attitude will have a positive effect on intention towards using mobile commerce.

As M-commerce is thought to be the next major phase in technological involvement following the E-Commerce era, one important factor identified to impact the adoption of E-Commerce, trust (T), will also be included in this study. According to Rousseau et al. (1998), trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another". Trust is important because it not only helps consumers overcome perceptions of uncertainty and risk (McKnight, 2002); but also helps build appropriate favorable expectations of performance and other desired benefits (Gefen, 2000). According the study by Wang et al. (2003), perceived credibility was measured by two items adapted to reflect specific user beliefs concerning the security and privacy protection of M-commerce. Furthermore, for trust to exist, "consumers must believe that the sellers have the ability and motivation to reliably deliver goods and services of the quality expected by the consumers" (Jarvenpaa, 2000). And following Gefen (2002), trust
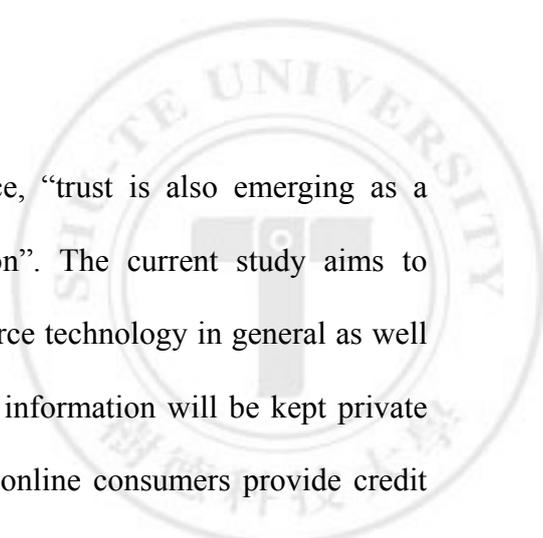
is not only an important factor to E-Commerce, "trust is also emerging as a potentially important antecedent of IT adoption". The current study aims to identify consumers' perceived trust of M-commerce technology in general as well as the consumers' perception that their personal information will be kept private while using mobile technology. Similar to how online consumers provide credit card or other personal information to online websites, consumers utilizing M-commerce channels will also be exposed to possible fraudulent or unethical use or distribution of personal information. Because of this, it is hypothesized that one who trusts using M-commerce technology will have more positive attitudes towards using M-commerce which is illustrated through the Hypothesis 5 as following:

H5: Trust will have a positive effect on attitude towards M- Commerce.

To study the effectiveness of m- commerce, we suggest a model integrating self-efficacy in intending M-commerce acceptance by TAM model. Durndell and Haag (2002) further found significant correlations among higher perceived self-efficacy more positive customer behavior intention toward the Internet and longer reported use of the Internet. The present study views self-efficacy as part of attitude toward using M-commerce. Since self-efficacy is defined as a person's belief in their ability to accomplish a specific task, the outcome variable in models employing a self-efficacy construct is often some measure of Task Performance. Furthermore, self-efficacy is a social-cognitive theory of personality which postulates a triadic reciprocal interaction between an individual's personal factors, environmental events and behavior (Maddux, 1995). Introduced by Bandura
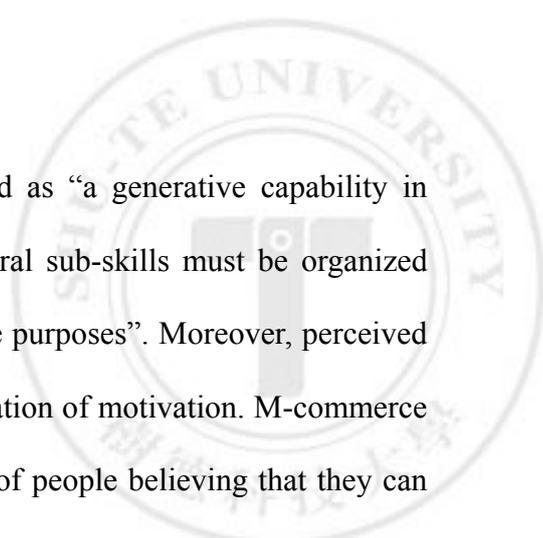
(1997), perceived self-efficacy has been defined as "a generative capability in which cognitive, social, emotional, and behavioral sub-skills must be organized and effectively orchestrated to serve innumerable purposes". Moreover, perceived efficacy is crucial for the development and regulation of motivation. M-commerce self-efficacy is typically manifested in the form of people believing that they can utilize the m- commerce successfully. Consequently, considering the model parsimony and the resources required to use M-commerce, the current study extends TAM by adding one internal behavioral control factor "perceived self-efficacy" to reflect people's concerns about their knowledge needed to use M-commerce, which is presented by the sixth hypothesis as following:

H6. Self-efficacy will have a positive direct effect on customer behavior intention to adopt M-commerce.

3.2. Research Design

Research design involves a series of rational decision-making choices. The research design was devised following a number of the researcher's decisions associated with the purpose of the study (exploratory, descriptive, hypothesis testing), the type of study it should be (type of investigation), the temporal aspects of the study (time horizon), the level at which the data would be analyzed (unit of analysis), how the data would be collected (data collection methods), how variables would be measured (measurement), and how they would be analyzed to test the hypotheses (data analysis).

Studies can be either exploratory, descriptive, hypothesis testing (analytical and predictive), or they may use case study analysis. Each one is also a method of solving problems. The purpose of this study was hypothesis testing in nature because usually,

studies relating to hypothesis testing explain the nature of certain relationships; establish the differences among groups or the independence of two or more factors in a situation. In other words, hypothesis testing is undertaken to explain the variance in the dependent variable. Hypothesis testing offers an enhanced understanding of the relationships that exist among variables, and could also establish cause and effect relationships.

There are two types of investigation: causal and correlational study. This is a correlational study since the research is interested in delineating the important variables that are associated with the problem instead of delineating the cause of one or more problems (a cause and effect relationship) - a causal study. This research also attempts to establish cause-and-effect relationships through certain types of correlational or regression analyses such as path analysis, just like some attempts by other researchers (Billings & Wroten 1978; Carter & Blalock 1975).

A study can be either a cross-sectional or longitudinal study. This research study is classified as a one-shot or cross-sectional study because it aims to collect data just once, perhaps over a period of months in order to answer the research objectives. It is different to a longitudinal study, where data on the dependent variable is gathered at two or more times to answer the research question.

Data collection is the process of collecting data associated with variables in the hypotheses in order to test the hypotheses that would be generated in this study. In this study, the questionnaire was delivered directly to students who studying in university in Ho Chi Minh City, Vietnam; and the other way to send the questionnaire via email to the users who attending M-commerce.

Data analysis is the step where data is analyzed statistically to see if the

hypotheses can be substantiated (details in Chapter 4 and 5).

There are many methodologies (Crotty 1998), for example, experimental research, survey research, ethnography, phenomenological research, grounded theory, heuristic inquiry, action research, discourse analysis, and feminist standpoint research. Among these methodologies, the survey research methodology (which is a positivistic methodology), was considered to be the most appropriate for this research. It is concerned with drawing a sample of subjects from a population and studying this in order to make inferences about the population. In the case of a small total population, this methodology normally allows data to be collected about each member of the population involved in the study (Hussey & Hussey 1997). In particular, this study was classified as an analytical survey where the main intention was to determine whether there is any relationship between different variables.

Methods used in this research were categorized into two groups (1) questionnaire method is the most important method used to collect primary data in the survey, and (2) many statistical methods were used to analyze data such as descriptive statistics, T-tests, correlation, and regression.

In order to minimize bias in this research, the researcher has focused on three areas when designing questionnaire, according to Sekaran (2003): (1) the wording of the questions, (2) planning of issues of how the variables will be categorized, scaled, and coded after receipt of the responses, and (3) the general appearance of the questionnaire.

The items used to measure the research model (items used in the questionnaire) are based mostly on items used in measurements by Davis et al, (1989), S.Taylor & P.A. Todd (1995), and Koufaris and Hampton-Sosa (2004). Statistical analysis methods were

then used to analyze data from the questionnaire survey.

A questionnaire is a list of carefully structured questions, chosen after considerable testing with a view to eliciting reliable responses from a chosen sample (Hussey & Hussey 1997). The theories and models (in Chapter 2), especially the theoretical framework and the research hypotheses (in Chapter 3) guided the questionnaire design process significantly. We integrated questions into the questionnaire only when they related to the research objectives. Some parts of questionnaires from previous studies which were considered relevant to the study and possibly for further data analysis were selected to become part of the input into the questionnaire design process. For example, questions used in measurement of the research model were based on the prominent models/theories (Davis 1989).

Based on the hypothesized model developed through a detailed review of the related literature on user acceptance of Mobile commerce, the questionnaire will be developed in English and then translated into Vietnamese by English teacher at Dalat university to make sure the translated questionnaire will be examined for semantic accuracy and wording. The questionnaire include 24-item questionnaire was devised as a measurement scale for the research.   All questions in our questionnaire is followed the 7-point Likert scale (1= strongly disagree; 2= Disagree; 3= somewhat disagree; 4= Neutral; 5= somewhat agree; 6= agree; 7= strongly agree.). Of course, the questionnaire was discussed with the thesis advisor and experts.

Our questionnaire constructs will be summarized as following.

- Section 1: Perceived usefulness (PU) is defined as the extent to which a person believes that using a particular system will enhance his or her job performance

(Davis et al, 1989). This construct is measured by 5 items that are adapted from Davis (1989).

- Section 2: Perceived ease of use is an individual's assessment of the extent to which interaction with a specific information system or technology is free of mental effort (Davis, 1989).includes 5 questions that are adapted from Davis (1989).

- Section 3: Attitude is determined by an individual's intention to use, which is jointly determined by an individual's attitude towards using a system (Davis et al., 1989). This construct is measured by 3 items that are adapted from Davis (1989).

- Section 4: Intention to use is a measure of the likelihood that a person will adopt the application (Davis et al. 1989). This construct is measured by 3 items that are adapted from Davis (1989).

- Section 5: Perceived Trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau et al., 1998). This construct is measured by 4 items that are adapted from Koufaris and Hampton-Sosa (2004)

- Section 6: Perceived Self-efficacy is defined as "a generative capability in which cognitive, social, emotional, and behavioral sub-skills must be organized and effectively orchestrated to serve innumerable purposes (Bandura, 1997). This construct is measured by 4 items that are adapted from Pedersen, P. E. (2005) & S. Taylor, P.A.,(1995)

3.3. Reliability Analysis of the Instrument

Testing goodness of data is testing the reliability and validity of the measures. According to Ticehurst and Veal (2000), reliability is the extent to which research
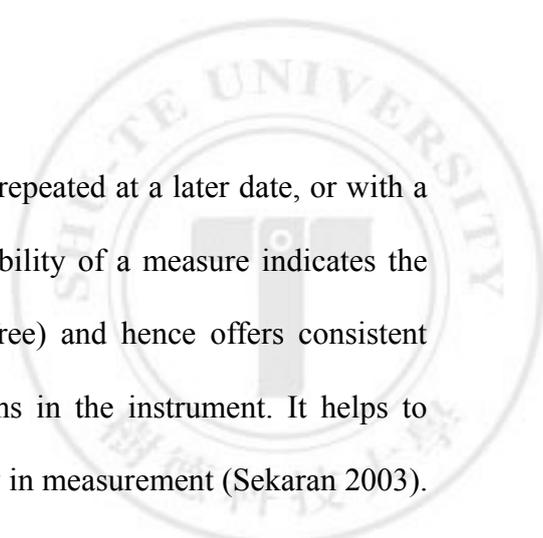
findings would be the same if the research were to be repeated at a later date, or with a different sample of subjects. In other words, the reliability of a measure indicates the extent to which the measure is without bias (error free) and hence offers consistent measurement across time and across the various items in the instrument. It helps to assess the goodness of measure, and indicates accuracy in measurement (Sekaran 2003). This research used the most popular test of inter-item consistency reliability that is the Cronbach's coefficient alpha (Cronbach 1951; Nunnally 1979; Peter 1979; Sekaran 2000). This is a test of the consistency of respondents' answers to all the items in a measure. To the degree that items are independent measures of the same concept, they will be correlated with one another (Sekaran 2000).

3.4. Validity of the Instrument

Validity is the extent to which the data collected truly reflect the phenomenon being studied. Usually, business research faces difficulties about validity, specifically in the measurement of attitudes and behavior, since there are always doubts about the true meanings of responses made in surveys, interviews, and self-reporting of behavior (Ticehurst & Veal 2000). According to Sekaran (2003), he suggests several types of validity tests for testing the goodness of measures include content validity, criterion-related validity, and construct validity.

3.4.1. Content Validity

Content validity or face validity assesses the correspondence between the individual items and the concept through ratings by expert judges, and pre-tests with multiple sub-populations or other means (Hair et al. 2006). It was used in this research. This research used both strategies to test content validity by (1) asking
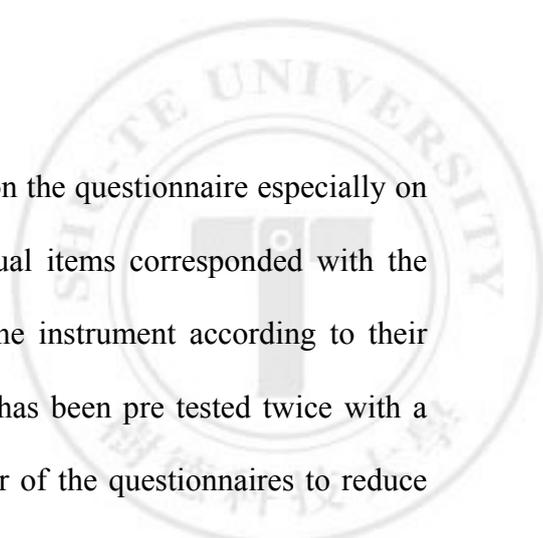
our thesis advisor in to provide their judgments on the questionnaire especially on the items in each set to check whether individual items corresponded with the concept. Some minor revisions were made to the instrument according to their suggestions. (2) Other than this, the instrument has been pre tested twice with a group of students to test the wordy and grammar of the questionnaires to reduce the ambiguity. Moreover, one pilot study was tested with a group of similar subjects as the population.

3.4.2. Construct Validity

Construct validity that was used in this research testified to how well the results obtained from the use of the measure fit the theories around which the test was designed. In other words, construct validity testified that the instrument did tap the concept as theorized. Construct validity can be established through (1) correlation analysis (convergent and discriminate validity), (2) factor analysis, and (3) the multitrait, multi-method method matrix of correlation ns. Others suggest the three most widely accepted forms of validity are convergent, discriminate, and nomological validity (Campbell & Fiske 1959; Peter 1981). Those will be presented in chapter 4 in more detail.

Convergent validity is synonymous with criterion validity (Zikmund 2003) and with correlational analysis, and is one way of establishing construct validity for this research. It indicates that items that are indicators of a specific construct should converge or share a high proportion of variance in common (Hair et al. 2006). In other words, it assesses the degree to which two measures of the same concept are correlated, with high correlation indicating that the scale is measuring

its intended concept. Thus reliability is also an indicator of convergent validity

(Hair et al. 2006).
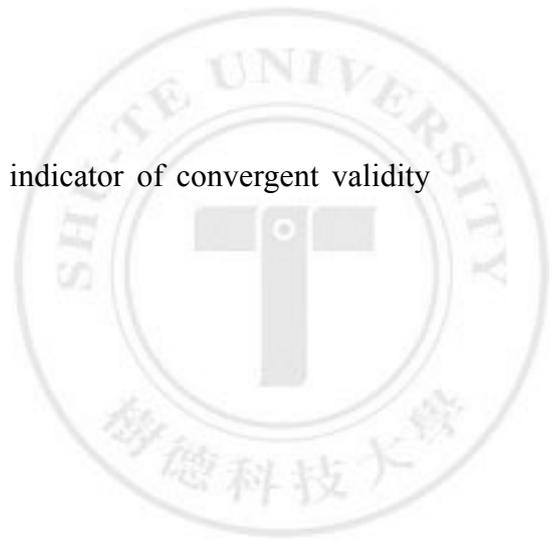
Chapter 4   Research Results

In this chapter, the statistical package for social science (SPSS) 13.0 for windows was used to analyze the data, in which, the analysis was conducted in two stages: instrument validation and hypothesis testing. To valid our measurement model, three types of validity were assessed: content validity, convergent validity, and discriminant validity. Content validity was established by ensuring consistency between the measurement items and the extant literature. This was done by interviewing senior practitioners and pilot- testing the instrument.

4.1. Samples and Demographics statistics

In this study, the questionnaires were randomly delivered to habitants, who were studying in university in Ho Chi Minh City during April, 2009. Totally 250 questionnaires were manually collected and collected by email. The demographics of sample are shown in the below table 1. From the results, it can be seen the gender distribution of the respondents was quite even, with 51.6% female respondents and 48.4% male respondents. The dominant age group of the respondents was from 20 to 29 years old (46.4%), followed by 30-39 years old (41.6%), whereas less than 20 years old made up the smallest group, representing 4.8% of the respondents.

With regard to respondents' individual income, the largest group includes those with a monthly income of US$200-$350 (34.4%), followed by US$350-$500 (24.4%), US$500-$750 (14.8%), less than US$200 (18%), and only 0.8% of respondents have an individual income of US$1000 and above.

The time of using M-commerce of the respondents are also shown in the Table 2. In the category of the number of people using M-commerce, there are 37.6% of the

respondents did not have previous experience with M-commerce. 24% of respondents use M-commerce once a month, 15.2% use every day. The numbers of people use M-commerce three times a week and once a week seem to be equal.

Table 2. Demographics statistic

Item	Categories	Frequency	Percent (%)
Gender	Male	121	48.4
	Female	129	51.6
Age	Less than 20 years old	12	4.8
	20-29 years old	116	46.4
	30-39 years old	104	41.6
	Over 40 years old	18	7.2
Salary	Less than $200	45	18
	$200-$350	86	34.4
	$350-$500	61	24.4
	$500-$750	37	14.8
	$750-$1000	19	7.6
	Over $1000	2	0.8
Time	once a month	60	24
	once a week	30	12
	three time a week	28	11.2
	everyday	38	15.2
	never	94	37.6

4.2. Validity and Reliability of Measurement

4.2.1. Validity of Measeurement

Validity indicates the degree to which an instrument measures the construct under investigation. Content validity refers to the subjective agreement among
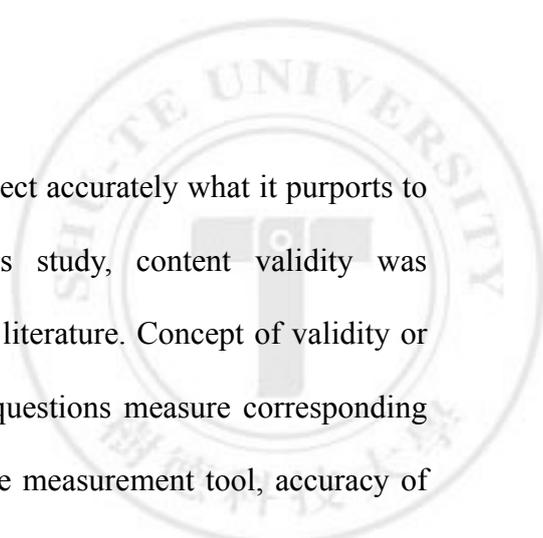
professionals that a scale logically appears to reflect accurately what it purports to measure (Zikmund, 2000). Therefore, in this study, content validity was strengthened through an extensive review of the literature. Concept of validity or internal validity response to how precisely the questions measure corresponding components. Without knowing the validity of the measurement tool, accuracy of the accumulated data cannot be trusted. To determine the validity of the questionnaires, various methods are available such as content validity and construct validity methods (Cooper and Schindler, 2003). The content validity of a measuring instrument is the extent to which it provides adequate coverage of the investigative questions guiding the study (Cooper and Schindler, 2003). This method usually is determined by experts in the proposed study subject. Content validity in the questionnaire of the current research was approved with the help of research and supervisors; finally after designing the questionnaire, a pilot test was conducted in order to assess the content validity, identify and omit potential problems, questionnaire's comprehension and estimate average completion time. The questionnaire was distributed to 34 students in Shute University. We asked them to fill the questionnaire, and also if there is any ambiguous issue they are welcome to tell us. Based on the feedback from the pilot respondents, all the constructs of this study are reviewed completely.

4.2.2. Reliability of Measurement

Reliability can be thought of as consistency in measurement. More detailed, reliability or external validity means that if the test is repeated under similar condition, to what extend the findings are similar and reliable a measure is reliable

to the degree that is supply consistent results (Cooper and Schindler, 2003). The most popular and commonly used method to assess internal consistency is Cronbach alpha which is defined as the average of all possible split-half coefficients, which result from different ways of splitting the scale items (Malhotra and Birks, 1999). They mentioned an alpha of 0.70 or higher as an appropriate range to measure the reliability. To assess the reliability of the questionnaire during this research, Cronbach alpha was used. The lower limit of 0.6 is considered acceptable for newly develop scales and 0.7 for established scales (Nunnally, 1994). As can be seen from the Table 3, all scales have Cronbach's alpha values which are higher than 0.7. Thus, according to finnally (1994), the results are totally acceptable.

Table 3. Constructs Reliability

Constructs	No of items	Mean	SD	Cronbach's alpha
Perceived Usefulness	5	5.324	1.057	0.915
Perceived Ease of Use	5	5.429	0.877	0.861
Attitude towards using M-commerce	3	5.447	0.956	0.819
Behavior intention to use M-commerce	3	5.544	0.954	0.862
Perceived Self-Efficacy	4	5.197	0.932	0.826
Perceived Trust	4	5.265	0.871	0.838

The mean and the standard deviation (SD) of a set of data are usually reported together, so their results of each constructs are also reported in Table 3. We can find that while the mean value of behavior intention to use M-commerce is

highest with 5.544 ('5'= somewhat agree; '6'=agree) which means that most respondent s seem to agree with using M-commerce technologies. On the other hand, the figure of perceived self- efficacy is lowest with 5.197 that show the somewhat agreement for confidence of M-commerce technologies using ability of the respondents.

The standard deviation of perceived usefulness is highest in all the value of the constructs. That indicates there are many different opinions of respondents for the benefits of using M-commerce and the responses of the items in this construct are far from the mean value (5.324) in compared with others of the remaining items. In contrast to this, the smallest standard deviation value (0.871) which is of perceived trust shows that the items' scores are relatively close to mean value (5.265) and less different in the interviewees' assessment.

4.3. Factor Analysis

In this stage, we use factor analysis to identify whether there is any relationship in this research. Factor analysis can identify the structure of a set of variable as well as provide a process for data reduction. In this research, perceived usefulness; perceived ease of use, perceived trust, perceived self-efficacy, attitude towards using M-commerce, and behavior intention to use M-commerce are in turn examined to make sure unit-dimension of research scale. Factor analysis is utilized to examine the patterns or dimensions underlying the data. Its main purpose is to condense or summarize the key features of a large number of variables for further analysis. A principal component for analysis associate with varimax rotation is used in the procedure. Furthermore, factor analysis was used to test a construct validity of the data and to identify underlying

constructs in the data, as well as to reduce the number of variables with the attempt to retain as much of the information as possible and make the remaining variables meaningful and easy to work with. Factor analysis process includes some steps; we will step by step discover the value of data.

Next, we examined the Assumptions in Factor Analysic, in which, basic assumptions on variables are Normality, Homogeneity, and Linearity. However, in this research we examine multi-collinearity assumption. We did use Pearson correlation coefficients, Bartlett test of sphericity, Measure of sampling adequacy (MSA) to assess multicollinearity. A statistically significant Bartlett's test of sphericity ($p>0.05$) indicates that sufficient correlations exist among the variables to proceed. Measured by Kaiser Meyer-Olkin (KMO), KMO varies from 0 to 1.0 and KMO must exceed 0.7. In overall test the value of KMO is 0.925 (Table 4), thus it satisfies the requirement.

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.925
Bartlett's Test of Sphericity	Approx. Chi-Square	6478.763
	df	990
	Sig.	.000

Next, the dependent and independent variables were subject to exploratory factor analysis as the extraction method and Varimax rotation with Kaiser Normalization. All factors with eigenvalues greater than 1 were extracted. Factor loading were evaluated on 2 criteria: the significant of the loadings and the simplicity of the factor structure. Items with loadings less than 0.5 were deleted from the analysis. As a result, all variables loaded satisfactory on to 6 latent factors. The factor analysis was also examined to

ensure acceptable level of multi-co linearity among latent factors. Factor analysis procedures are base on the original data of inter-correlations among the variables (correlation matrix). Then the correlation matrix will be transformed through estimation of a factor model to obtain a factor matrix-containing factor loading for each variable on each derived factor. To deriving factor, we use PCA (Principle Component Analysis). This method is based on covariance or correlation matrix, extracting eigenvalue (l) and eigenvector to accommodate variances from original variables.

The factor analysis underlines 6 factors as following:

Perceived Usefulness (Factor 1) contained five attributes and explained 74.729% of the variance in the data, with an eigenvalue of 3.736. The attributes, including PU1, PU2, PU3, PU4, PU5

Table 5.   Results for the extraction of component factors of PU

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
PU1	3.736	74.729	74.729	3.736	74.729	74.729
PU2	.388	7.760	82.489			
PU3	.342	6.850	89.338			
PU4	.313	6.252	95.590			
PU5	.220	4.410	100.000			

Extraction Method: Principal Component Analysis.

Perceived Ease of Use (Factor 2) contained five attributes and explained 64.609% of the variance in the data, with an eigenvalue of 3.230. The attributes, including PEOU1, PEOU2, PEOU3, PEOU4, PEOU5

Table 6. Results for the extraction of component factors of PEOU

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
PEOU1	3.230	64.609	64.609	3.230	64.609	64.609
PEOU2	.607	12.148	76.757			
PEOU3	.456	9.128	85.885			
PEOU4	.410	8.207	94.092			
PEOU5	.295	5.908	100.000			

Extraction Method: Principal Component Analysis.

Attitude towards using M-commerce (Factor 3) contained three attributes and explained 73.682% of the variance in the data, with an eigenvalue of 2.210. The attributes, including ATT1, ATT2, ATT3

Table 7. Results for the extraction of component factors of ATT

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
ATT1	2.210	73.682	73.682	2.210	73.682	73.682
ATT2	.489	16.314	89.996			
ATT3	.300	10.004	100.000			

Extraction Method: Principal Component Analysis.

Behavior intention to use M-commerce (Factor 4) contained three attributes and explained 78.384% of the variance in the data, with an eigenvalue of 2.352. The attributes, including IU1, IU2, IU3

Table 8. Results for the extraction of component factors of IU

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
IU1	2.352	78.384	78.384	2.352	78.384	78.384
IU2	.346	11.529	89.913			
IU3	.303	10.087	100.000			

Extraction Method: Principal Component Analysis

Perceived Self-Efficacy (Factor 5) contained four attributes and explained 65.850% of the variance in the data, with an eigenvalue of 2.634. The attributes, including PSE1, PSE2, PSE3, PSE4

Table 9. Results for the extraction of component factors of PSE

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
PSE1	2.634	65.850	65.850	2.634	65.850	65.850
PSE2	.517	12.927	78.777			
PSE3	.463	11.570	90.347			
PSE4	.386	9.653	100.000			

Extraction Method: Principal Component Analysis.

Perceived Trust (Factor 6) contained four attributes and explained 67.268% of the variance in the data, with an eigenvalue of 2.691. The attributes, including PT1, PT2, PT3, PT4

Table 10. Results for the extraction of component factors of PT

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
PT1	2.691	67.268	67.268	2.691	67.268	67.268
PT2	.471	11.777	79.045			
PT3	.428	10.703	89.748			
PT4	.410	10.252	100.000			

Extraction Method: Principal Component Analysis.

Finally, the final results of the factor analysis are shown in the below table 11. In this test, the items for the same construct should be closely related to the underlying latent variable and the factor loading which is used to group the items into one representative factor is 0.5 and higher. As result, the six factors are: Perceived usefulness, Perceived Ease of Use, Attitude towards using M-commerce, Behavior intention to use M-commerce, Perceived Self-Efficacy, and Perceived Trust

Table 11. Result of factor analysis

Constructs	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
PU1	0.856					
PU2	0.862					
PU3	0.838					
PU4	0.886					
PU5	0.879					
PEOU1		0.710				
PEOU2		0.814				
PEOU3		0.862				
PEOU4		0.801				
PEOU5		0.824				
ATT1			0.895			
ATT2			0.862			
AAT3			0.817			
IU1				0.887		
IU2				0.876		
IU3				0.893		
PSE1					0.823	
PSE2					0.790	
PSE3					0.845	
PSE4					0.787	
PT1						0.811
PT2						0.819
PT3						0.818
PT4						0.833

4.4. Correlation Coefficient

The relationships between each construct which are shown in Table 12 are tested by using bivarate correlation analysis. As from the table 12, all correlations are positive and relative strong. The figures show the correlation coefficient of the constructs as PU, PEOU, ATT, IU, PSE, and PT with themselves are all positive and significant at 0.001 levels (2-tailed).

Table 12. Bivariate correlations among variables

	PU	PEOU	ATT	IU	PSE	PT
Perceived Usefulness(PU)	1.000					
Perceived Ease of Use(PEOU)	0.746**	1.000				
Attitude towards using M-commerce(ATT)	0.676**	0.769**	1.000			
Behavior intention to use M-commerce(IU)	0.606**	0.659**	0.731**	1.000		
Perceived Self-Efficacy(PSE)	0.776**	0.665**	0.599**	0.661**	1.000	
Perceived Trust(PT)	0.660**	0.680**	0.678**	0.647**	0.711**	1.000

** Correlation is significant at the 0.001 level (2-tailed).

4.5. Multiple Regressions

Multiple regression analysis is the study of how a dependent variable is related to two or more independent variables. Multiple- regression, a general linear model technique, is one the most popular method for studying the relationship between an outcome variable and several predictors, or independent variables. To test the hypothesis, when the p-value is less than 0.05 (significant level), then the independent variables affect the dependent variable. Otherwise, they don't have relationship. They are used to test the hypotheses in this study.

4.5.1. Explaining Attitude toward using M-commerce

In the first regression, Attitude toward using M-commerce is entered as the dependent variable, while PU; PEOU, and PT are simultaneously entered as independent variables. The following multiple regression will be used to test Hypothesis 1, 2 and 5.

$$Y_1 = a + \beta1* X_1 + \beta2* X_2 + \beta3* X_3$$

Where,

Y_1 = Attitude toward using M-commerce (ATT)

X_1 = Perceived Usefulness

X_2 = Perceived Ease of Use

X_3 = Perceived Trust

a = constant (coefficient of intercept)

β1, β2, β3 = regression coefficient of Factor 1, Factor 2,and Factor 5

The results, presented in table 13, show support for Hypotheses 1, 2 and 5 as PU, PEOU and PT emerged as significant predictors of ATT. Further, the significant change in R-square (R^2=0.644) indicated that 64.4% of the variance in ATT is explained by the PU, PEOU and PT

Table 13. Regression results – Attitude toward using M-commerce

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.401	0.246		1.632	0.104
	PEOU	0.538	0.067	0.493	8.001	0.000
	PT	0.272	0.06	0.248	4.539	0.000
	PU	0.131	0.054	0.144	2.398	0.017
Adj.R square			0.644			

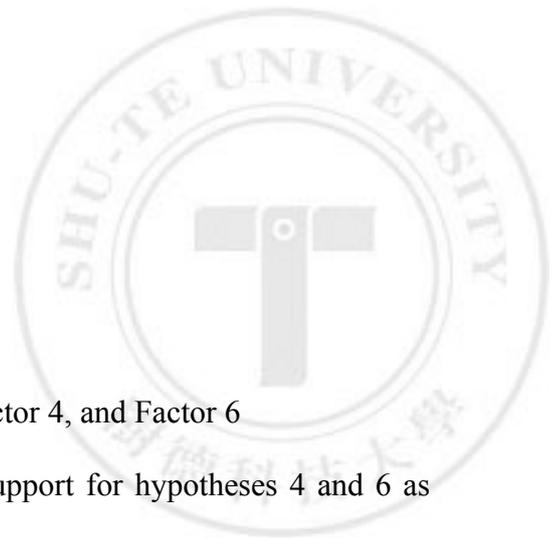4.5.2. Explaining Behavior Intention to use M-commerce

In the second regression, PU, PSE and ATT are the independent variables and Behavior Intention to use M-commerce is the dependent variable. The following multiple regression will be used to test Hypothesis 3, 4 and 6.

$Y_2 = a + β1* X_1 + β2* X_2 + β3* X_3$

Where,

Y_2 = Behavior Intention to use M-commerce (IU)

X_1 = Perceived Usefulness

X_2 = Perceived Self-Efficacy

X_3 = Attitude toward using M-commerce

a = constant (coefficient of intercept)

β1, β2, β3 = regression coefficient of Factor 3, Factor 4, and Factor 6

The results, presented in table 13, show support for hypotheses 4 and 6 as ATT and PSE both emerged as significant predictors of IU. Meanwhile, hypothesis 3 is not supported because PU has no significant relationship with Behavior Intention to use M-commerce (p=0.474>0.05). Further, the significant change in R-square (R²=0.612) indicates that 61.2% of the variance in was explained by the ATT and PSE

Table 14. Regression results – Behavior Intention to use M-commerce

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.855	0.242		3.537	0.000
	ATT	0.537	0.054	0.538	9.861	0.000
	PSE	0.386	0.065	0.377	5.909	0.000
	PU	-0.045	0.062	-0.050	-0.718	0.474
Adj. R square				**0.612**		

Dependent Variable: IU

Following the result of table 14, PU factor was not supported. So, the other regression model was run in which PU was not entered add the independent variable. In other word, we just examine the relationship among PSE, ATT, and IU to show their exact effect on dependent variables. As the following table 15

Table 15. Regression results – Behavior Intention to use M-commerce

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.858	0.241		3.554	0.000
	ATT	0.520	0.049	0.522	10.530	0.000
	PSE	0.356	0.051	0.348	7.023	0.000
Adj. R square			**0.612**			

Dependent Variable: IU

4.6. Summary of Testing Results

Figure 2 shows a summary presentation of results. From the model, it indicates that Perceived Ease of Use (β=0.493) was a strong determinant of Attitude toward using M-commerce, followed by Perceived Trust (β=0.248), then by Perceived Usefulness (β=0.144). In addition, Attitude toward using M-commerce (β=0.522) is the most significant determinant for Behavior Intention to use M-commerce, followed by Perceived Self-Efficacy (β=0.348). Furthermore, with β=-0.050, Perceived Usefulness is said to negatively affect Behavior Intention to use M-commerce. The test results for all hypotheses are shown in Table 16

Table 16. Hypotheses Testing Results

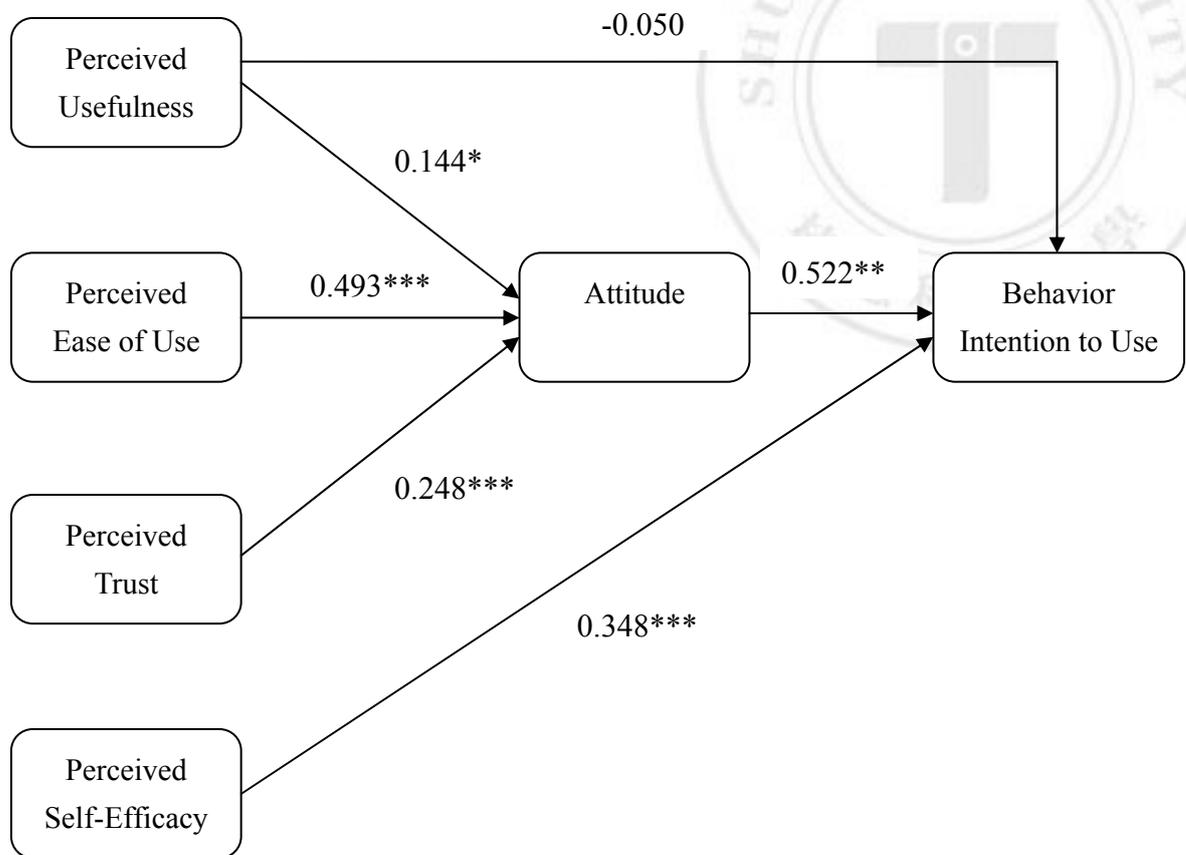| Hypotheses	t-value	p-value	Result
H1	2.398	0.017	Support
H2	8.001	0.000	Support
H3	-0.718	0.474	Not support
H4	9.861	0.000	Support
H5	4.539	0.000	Support
H6	5.909	0.000	Support

Figure 2. Results for Proposed of Model

Chapter 5　Conclusions

5.1. Conclusion and Discusion

The purpose of this article has been to explore factors that influence the intention of users to adopt mobile commerce. For this purpose a simple model based on technology acceptance model was developed and measured. The research results significantly verified the hypothesis between perceived usefulness, and perceived ease of use, personal trust and perceived self-efficacy to Attitude and Behavior Intention to use M-commerce.

First, this study successfully applied the TAM. Consistent with previous studies, perceived usefulness and perceived ease of use were found to be significant antecedents of the attitude to use mobile commerce. Therefore, the managers should design the M-commerce interface.

Second, this study found a significant direct relationship between perceived trust and behavioral intention to use M-commerce. The results of our research also entail important practical implications. By identifying the major driver for M-commerce adoption, our results can help managers to prioritize their M-commerce initiatives and to allocate resources accordingly. For instance, potential adopters of M-commerce are highly sensitive to the issues of trust. The major trust-based concerns may include privacy protection, accuracy to declaration, and unauthorized access and so on. Such results imply that M-commerce providers need to protect users' privacy and account for such factors in developing their marketing strategy.

For practitioners, although M-commerce is mainly presented for usage by the features of the Internet and communication technologies, however, this study shows that
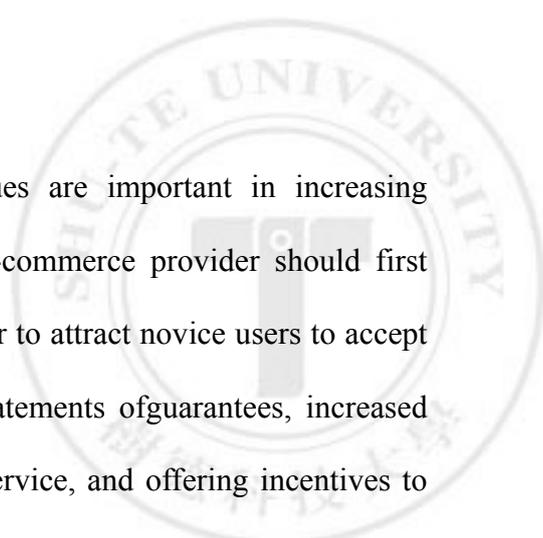
recognizing both technological and trust-based issues are important in increasing citizen's behavioral intention to use this service. M-commerce provider should first develop trust building mechanisms for citizens in order to attract novice users to accept on-line tax. Examples of the mechanisms include statements ofguarantees, increased familiarity through advertising, long-term customer service, and offering incentives to use. After that, PU of M-commerce emerges as an important issue in attracting new users and should be carefully designed in terms of users' requirements to reflect PU ofthis service. Without an original consideration from trust aspect, a well-designed on-line tax with significant PU will not well perform in attracting novice users.

Third, perceived self-efficacy was also found to be significant antecedents of behavioral intention to use M-commerce. Measures of perceived self-efficacy was developed and tested. These measures not only represent specific instruments that can be used to assess perceived knowledge and financial resources, but can also be used by researchers and practitioners to determine which areas represent potential leverage points to increase behavioral intention to use M-commerce. The significant impacts for self-efficacy on intention to use M- commerce indicate that customer' self-efficacy should be seriously considered in promoting them to use M- commerce. Such relationships are also consistent with numerous studies in information system usage. Training that instructs the citizens how to effectively search for needed information is a useful method to strengthen self-efficacy. According to Bandura, enactive attainment "provides the most influential source of efficacy information because it can be based on authentic mastery experiences". When people feel they are capable of using M-commerce, they will tend to prefer and even enjoy behaviors if they feel they can

successfully master. Furthermore, training customer how to use M- commerce would make them aware of the valuable information and advantages exit in the process of using M-commerce and show them how to access that information quickly and efficiently.

The last but the least important finding is the unsignificant effect of PU on Behavior Intention to use M- commerce. Once use perceived the usefulness, they will have a positive attitude toward using the M-commerce; however it does not mean that they will have the intention to use this service. This might be explained within the Vietnam context. In Vietnam now, there are not many people can afford to use M-commerce, they might have a good attitude towards using M- commerce, they might perceived the the usefulness of M-commerce, however, if they cannot afford for it, then they will hestitate to use. Moreover, it might be explained due to one of the characteristics of Vietnamese which is careful and cautious. Even when they know that M- commerce is very useful, they still need time to find more information it, as well as need time to see the evaluation of the ones who are using M-commerce. They will intend to use M-commerce until they have enough information and opinions and assure that using M-commere is not harmful. They also need time to have enough knowledge and skill to master the M- commerce to avoid the remarkable risks .Once more, building trust and enhance the self efficacy are very important to foster people intention to use M- commerce.

5.2. Limitations

Even though this research has drawn intellectually and practically meaningful implications, results of this study must be interpreted in the context of its limitations.

One of the limitations of the study is firstly that the scope of this study was limited by its population frame; this study is in the areas of sampling and non-response bias. In this study, the questionnaires were randomly delivered to habitants, who were studying in university in Ho Chi Minh City during April, 2009. Probably lacking the diversity that can be expected from a comparable sample chosen from across an entire country, Vietnam

Secondly, because of the limitation of time and the sample size, we just collected 250 samples; so it may not be representative of the general population of M-commerce users. Finally, because there was not any other related research which has been done about M-commerce in Vietnam, literature review was limited.

5.3. Suggestions and further studies.

Although our findings strongly support the proposed model, there is still room for improvement and further investigation. Our study should be replicated in different contexts for further validation and exploration of possible moderating effects.

Also the current research focuses on B2C M-commerce that may involve different factors from those of B2B M-commerce. In the B2B M-commerce context, organizational theories may be necessary to be incorporated to understand adoption behavior. Future research should also follow a longitudinal approach and investigate the relationship between intention and actual behavior. Moreoever, as we explained above, the users in Vietnam might refer to the others' opinions; therefore, the further research might study on the

Further research can use different methodologies, such as focus groups and interviews to examine the applicability of the research model adopted in this study.

Furthermore, in future, we can try to put "perceived cost" like a main factors for decisions of customers in using M-commerce services.

References
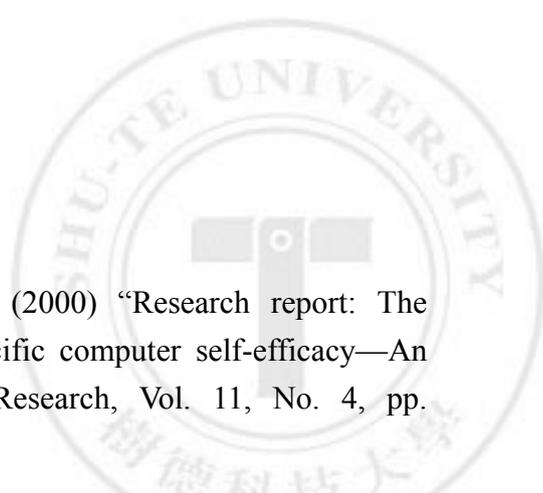
[1] Agarwal, R., Sambamurthy, V.& Stair, R.M. (2000) "Research report: The evolving relationship between general and specific computer self-efficacy—An empirical assessment", Information Systems Research, Vol. 11, No. 4, pp. 418-430.

[2] Aldin. N., Brehmer, P.O., Johansson, A. (2004), "Business development with electronic commerce: refinement and repositioning", Business Process Management Journal, Vol. 10, No.1, pp.44-62.

[3] Antonides & Fred W. van Raaij (September, 1999): Consumer behavior. A European perspective, Vol 22, No 3, pp. 375-392

[4] Balasubramanian. S., Peterson R. A. and Järvenpää S. L. (2002) "Exploring the Implications of M-commerce for Markets and Marketing, Journal of Academy of Marketing Science Vol. 30, No. 4, pp. 348-361.

[5] Bandura. A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.

[6] Bandura. A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, Vol 84, pp. 191-215.

[7] Bandura. A. (1982). Self-efficacy mechanism in human agency. American Psychologist, Vol 37, pp. 122-147.

[8] Barnes, S.J. (2002) 'the mobile commerce value chain: analysis and future developments', International Journal of Information Management, Vol. 22, No 2 (April), pp. 91-108.

[9] Bauer, Hans H., Tina R., Barnes S.J, and Marcus M.(2005), "Driving Consumer Acceptance of Mobile Marketing: A Theoretical Framework and Empirical Study," Journal of Electronic Commerce Research, Vol 6 , pp. 181-92.

[10] Baumol; Ulrike; Stiffel, Thomas and winter, Robert (2003), "A Concept for the Evaluation of E-Commerce Ability". Hershey, PA, USA: Idea Group Inc., pp.1-18

[11] Benassi, P.(1999), "TRUST: An Online Privacy Seal Program," Communications of the ACM, Vol. 42, No 2, pp. 56-59.
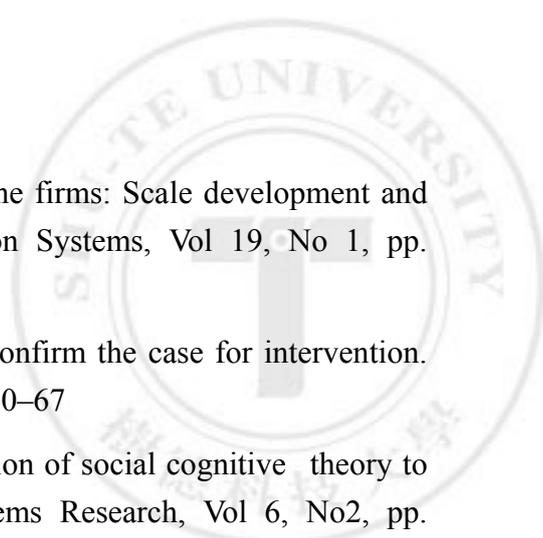
[12] Bhattacherjee A. (2002), Individual trust in online firms: Scale development and initial test. Journal of Management Information Systems, Vol 19, No 1, pp. 211-241.

[13] Clarke, R. (1999)., Internet privacy concerns confirm the case for intervention. Communications of the ACM, Vol 42, No 2, pp. 60–67

[14] Compeau, D.R., Higgins, C.A., (1995). Application of social cognitive theory to training for computer skills. Information Systems Research, Vol 6, No2, pp. 118-143.

[15] Compeau, D.R., Higgins, C.A., (1999). Social cognitive theory and individual reactions to computing technology: a longitudinal study. MIS Quarterly Vol 23, No 2, pp. 145-158.

[16] Constantinides, E., (2004) "Influencing the online cosumer's behavior: The Wed experience". Journal: Internet Research: Electronic Networking Applications and policy, Vol.14, No 2, pp.111-126

[17] Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management Science, No 35, pp. 982 – 1003.

[18] Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Quarterly, Vol. 13, No. 3

[19] Davis, L.D., Bagozzi, R.P., & Warshaw, P.R. (1989), "User acceptance of computer technology: A comparison of two theoretical models," Management Science, Vol. 35, No. 8, pp. 982-1003.

[20] Dholakia R., Wendy F. , Jessica K., Jie H. , and M. Meyyappan (April 2004), "Transport in self-assembled molecular wires: Effect of packing and order", pp.14

[21] Diana K., Judith D., (2003), "A strategy-based model for e-commerce planning". Industrial Management and Data Systems Vol. 103, No.4, pp.238-252

[22] EITO (2004), "European Information Technology Observatory 2004", Vol 15, Brussels.

[23] Gefen, D., Karahanna, E. & Straub, D. W., (2003), "Trust and TAM in Online Shopping: An Integrated Model," MIS Quarterly, Vol 27, No 1, pp. 51-90.
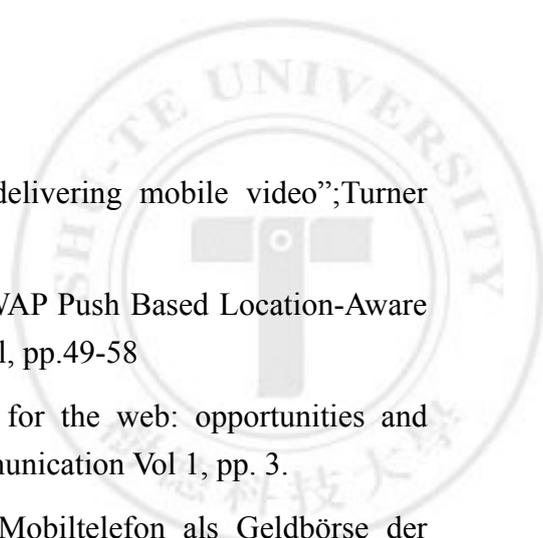
[24] Gertel; Tom (2005), "Streams and standards delivering mobile video";Turner Broadcasting System, pp.49-53.

[25] Gothlin, Nicklas et al., (2004), "Bluetooth and WAP Push Based Location-Aware Mobile Advertising System", Article type: Journal, pp.49-58

[26] Hoffman et al., (1996), Commercial scenarios for the web: opportunities and challenges. Journal of Computer-Mediated Communication Vol 1, pp. 3.

[27] Hohenberg, H. E. / Rufera, S. (2004), "Das Mobiltelefon als Geldbörse der Zukunft – Chancen und Potentiale des Mobile Payment (M-Payment"), Vol. 43, No. 168, pp. 33-40.

[28] Hsin-Hui Lin & Yi-Shun Wang (2005), "Predicting Consumer Intention to Use Mobile Commerce in Taiwan"

[29] Hsu, M.H., Chiu, C.M., (2004). "Internet self-efficacy and electronic service acceptance. Decision Support Systems" Vol 38, No 3, pp. 369-381.

[30] http://www.openmobilealliance.org/tech/affiliates/wap/wapindex.html

[31] James, et al., (2002), "Ten usability principles for the development of effective WAP and M-commerce services". Article Type: Case Study, Vol.54, No.6, pp. 354-355

[32] Johnson V., Rubin B (2000), "The San Francisco Project: Business Process Components and Infrastructure", ACM, pp. 25-29

[33] Johnson, R.D., Marakas, G.M., (2000), "Research report: the role of behavioral modeling in computer skills acquisition-toward refinement of the model". Information Systems Research Vol 11, No 4, pp. 402-417.

[34] K. Siau and Z. Shen (2003), "Building customer trust in mobile commerce," Communications of the ACM, pp. 91-94

[35] Kalakota and Robinson, (April, 1999). "E-Business 2.0: Roadmap for Success"

[36] Kalakota, Ravi (2001), "M-business: The Race to Mobility". Blacklick, OH, USA: McGraw-Hill Companies

[37] Kelley and Thibaut, et al., (1978), "Interpersonal Relations: A Theory of Interdependence", Wiley, New York
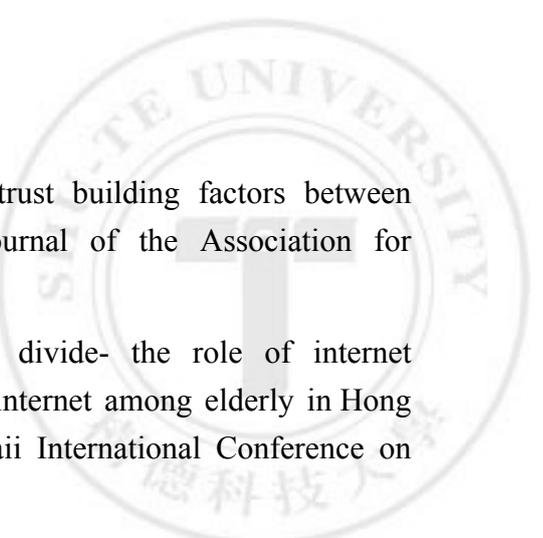
[38] Kim et al., (2004). "A comparison of online trust building factors between potential customers and repeat customers", Journal of the Association for Information Systems Vol 5, No. 10, pp. 392–420

[39] Lam, J., Lee, M., (2005). Bridge the digital divide- the role of internet self-efficacy towards learning computer and the internet among elderly in Hong Kong, China. In: Proceedings of the 38th Hawaii International Conference on System Science, pp. 1-10.

[40] Lee, C; Kou, W & Hu, W (2005), "Mobile Commerce Security and Payment Methods", Advances in Security and Payment Methods for Mobile Commerce, Idea Group Publishing, Hershey, Pennsylvania.

[41] Liao C. H., Tsou C. W., & Huang M. F. (2007). Factors influencing the usage of 3G mobile services in Taiwan. Online Information Review Vol. 31 No. 6, pp. 759-77.

[42] Luarn, P., Lin, H.H. (2005), "Toward an understanding of the behavioral intention to use mobile banking", Computers in Human Behavior, Vol. 21 No.6, pp.873-91.

[43] Mallat, N., et al., (2004), "Mobile Banking Services", Vol.46, No.12, pp.251-257

[44] McCaffery, et al., (2004), " The need for Real Time Consistency Management in P2P Mobile Gaming Environments", pp.203-211

[45] McIvor, Paul & Huang (2000), "International Journal of Services Technology and Management" Vol.3, No.2, pp.192 – 207

[46] Mesenbourg, T (March 30, 2001), "Measuring the Digital Economy".

[47] Moon, J.W. & Kim, Y.G. (2001), "Extending the TAM for a world-wide-web context", Information & Management, Vol. 38, No. 4, pp. 217-30.

[48] Müller-Veerse, F (1999), Mobile commerce report. London: Durlacher. Retrieved November 19, 1999

[49] Nambiar S., Lu C T., (2005),"M-Payment Solutions and M-commerce Fraud Management".

[50] Norman Sadeh (2002), "M Commerce: Technologies, Services, and Business Models"

[51] P. Krishnamurthy and K. Pahlavan (2002), "Principles of Wireless Networks – A Unified Approach", Wireless Geolocation Systems, pp.17-18.

[52] Peter, J.P. & Donnely Jr., J.H. (2000), "A Preface to MarketingManagement"

[53] Rajnish T., et al (2006), "The Mobile Commerce Technologies: Generations, Standards and Protocols"

[54] Ronan Mc., et al., (2000), "Electronic commerce: re-engineering the buyer-supplier interface" Vol.6, No.2, pp.122 – 138

[55] Rowley, Jennifer (2000), "Product search in E-shopping: a review and research propositions". Journal of Customer marketing, Vol.17, No.1, pp.20-35

[56] Schaller, S., et al., (2004), " A Mobile Gaming Platform for the IMS", pp.77-84.

[57] Scharl, A. (2005), "Patterns of Content Propagation in Electronic Environments", International Symposium on Generalization of Information (ISGI-2005).

[58] Schunk, D. H. (1981). Modeling and attribution efforts on children's achievement:

[59] Siau, K. and Shen, Z. (2003). Building Consumer Trust in Mobile Commerce Communications of the ACM, Vol 46, No 4, pp. 91-93

[60] Song J., Koo C., Kim Y. (2007). Investigating Antecedents of Behavioral Intentions in Mobile Commerce. Journal of Internet Commerce, Vol. 6, No 1.

[61] Stanoevska-Slabeva, K. (2003): "Towards a Reference Model for M-commerce Applications"

[62] Stichling, D., et al., (2004)," Foot-based mobile Interaction with Games", pp.321-324.

[63] Stoica, Michael (2001), "The Impact of Mobile Commerce on Small Business and Entrepreneurship" Coleman Foundation.

[64] Sutherland, J., & McKenna, J (1994), "Internal communication", Easel Corporation

[65] Sutinen, T., et al., (2004), " Mobile Karpat- A case study in Wireless Personal Area Networking" The ACM, Vol 47, No 5, pp. 42-46.

[66] Swan, J.E., Bowers, M.R., (2002), "Customer involvement in the selection of service specification", Journal of Services Mareting, Vol 16, No.1, pp 88-103

[67] The Wireless World Research Forum (WWRF) (2000), "Book of Visions", pp. 9

[68] Timmers & Paul (2000), "Electric commerce: Strategies and models for Business to Business tranding". Article type: Review, Publication.
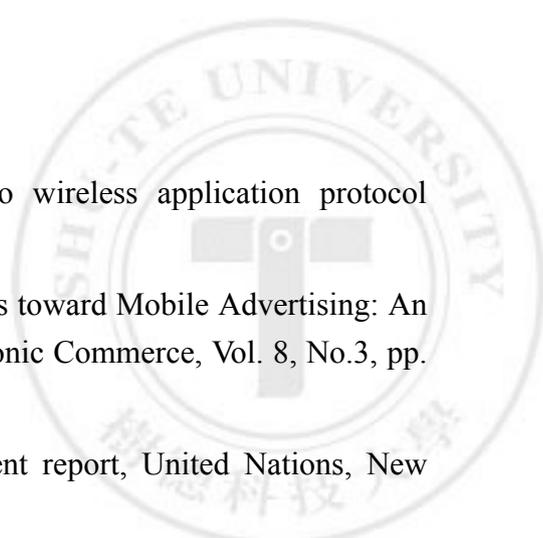
[69] Tino F., et al (2002), "Exploratory study into wireless application protocol shopping".

[70] Tsang, M. M., et al., (2004), "Consumer Attitudes toward Mobile Advertising: An Empirical Study," International Journal of Electronic Commerce, Vol. 8, No.3, pp. 65-78.

[71] UNCTAD, (2002), E-commerce and development report, United Nations, New York and Geneva

[72] Upkar V., Alisha D. Malloy(September 2006), "Multilevel fault tolerance in infrastructure-oriented wireless networks: framework and performance evaluation", International Journal of Network Management, Vol 16, No.5, pp.351-374,

[73] Varshney, et al (2002), "Supporting mobile commerce applications using dependable wireless networks" Vol.7 , No 3, pp. 225 - 234

[74] Varshney, Upkar (2003), "Location Management for Mobile Commerce Applications in Wireless Internet Environment". Article type: Journal, Vol.3, pp.236-255.

[75] Veijalainen et al., (2003) "Transaction Management for M-commerce at a Mobile Terminal", Vol.3, pp.2

[76] Venkatesh, V., and Davis, F. D, (2000)."A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies", Management Science, Vol 46, No 2, pp. 186-204.

[77] W. Zheng and Y. Yuan, (2004) "Identifying Critical Factors for the Success of Mobile Workforce Applications"

[78] Wang et al. (2003), "Determinants of user acceptance of Internet banking: An empirical study," International Journal of Service Industry Management, Vol. 14, No. 5, pp.501- 519.

[79] Wood, R. & Bandura, A. (1989). "Social cognitive theory of organizational management". Academy of Management Review. Vol 14, No 3, pp. 361–384

[80] Wu J., Wang., et al., (2005). "What drives mobile commerce? An empirical evaluation of the revised technology acceptance model". Information & Management, Vol 42, No 5, pp. 719-729
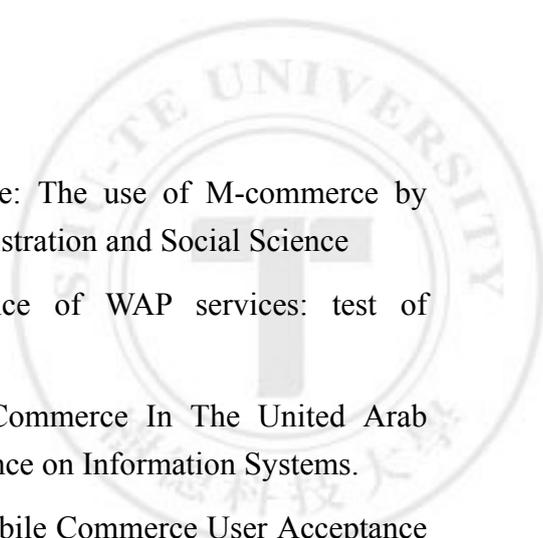
[81] Shahidul I.S, et al., (2006), "Mobile commerce: The use of M-commerce by customer today". Department of Business Administration and Social Science

[82] Shin-Y.H, Chia-M.C, (2004), "User acceptance of WAP services: test of competing theories".

[83] Tariq B., (2008), "The Adoption of Mobile Commerce In The United Arab Emirates", European and Mediterranean Conference on Information Systems.

[84] MIN Qingfei, JI Shaobo, QU Gang, (2008), "Mobile Commerce User Acceptance Study in China", Vol 13, No 3.

[85] Jaeki S., Chulmo K., Yongjin K. , (2007), "Investigating Antecedents of Behavioral Intentions in Mobile Commerce"Journal of Internet Commerce, Vol. 6, No 1.

[86] Tariq B., Zayed University, (2007), "Exploring Factors Influencing The Adoption Of Mobile Commerce"

[87] Mark T.D., et al., (2002), "Extending the task-technology fit model with self-efficacy constructs", Eighth Americas Conference on Information Systems

Appendix 1 Questionnaire

My name is LE THANH HOANG. I am currently a Master of Science student of the Shu-Te University. My supervisor is Dr MING- HSIUNG HSIAO. The purpose of my study is to investigate the factors affecting customer behavioral intention towards M-commerce in Vietnam. I would like to receive your support by carefully answering the following questions. Your opinions will be kept confidential and will be only used for the research purpose. If you have any questions regarding this research please contact me at email address: qinghuang85@gmail.com

Thank you sincerely for your help and co-operation.

Shu Te University
Information Management Department
Advisor: Dr. Ming- Hsiung Hsiao
Student: Le Thanh Hoang

===============📖==============

➢ Mobile Commerce has been defined as follows: "Mobile Commerce is any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device."

✓ Mobile device such as a mobile phone (cell phone), a PDA, a smartphone and other emerging mobile equipment such as dashtop mobile devices.

| O2 | Iphone | Smartphone |

Part 1: Please tick (✓) on the appropriate box responding to the number that is most closed to your opinion. All the responses will be ranged as: (1) Strongly disagree; (2) Disagree; (3) somewhat disagree; (4) Neutral; (5) somewhat agree; (6) agree; (7) Strongly agree**.** Please respond to each item.

I. Perceived ease-of-use	**Strongly disagree**	**Disagree**	**Somewhat disagree**	**Neutral**	**Somewhat agree**	**Agree**	**Strongly agree**
	1	2	3	4	5	6	7
1. Learning to use mobile commerce services is easy to me	❏	❏	❏	❏	❏	❏	❏
2. It is easy to make the mobile commerce services do what I want them to	❏	❏	❏	❏	❏	❏	❏
3. My interaction with mobile commerce services is clear and understandable	❏	❏	❏	❏	❏	❏	❏
4. I find it easy to interact with mobile commerce services	❏	❏	❏	❏	❏	❏	❏
5. I find it easy to use mobile commerce services	❏	❏	❏	❏	❏	❏	❏
II. Perceived usefulness							
1. Using mobile commerce services makes me save time	❏	❏	❏	❏	❏	❏	❏
2. Mobile commerce services make me a better consumer	❏	❏	❏	❏	❏	❏	❏
3. Using mobile commerce services improves my efficiency as a consumer	❏	❏	❏	❏	❏	❏	❏
4. Mobile commerce services are useful to me as a consumer	❏	❏	❏	❏	❏	❏	❏

5. Mobile commerce services increases my effectiveness as a consumer	❏	❏	❏	❏	❏	❏	❏

III. Attitudes toward using the M-commerce	**Strongly disagree**	**Disagree**	**Somewhat disagree**	**Neutral**	**Somewhat agree**	**Agree**	**Strongly agree**
	1	2	3	4	5	6	7
1. I like to use M-commerce	❏	❏	❏	❏	❏	❏	❏
2. It is pleasure for me to use M-commerce	❏	❏	❏	❏	❏	❏	❏
3. It is desirable for me to learn how to use M-commerce	❏	❏	❏	❏	❏	❏	❏
IV. Behavioral intention to use M-commerce							
1. I intend to use the mobile site through a device in the future.	❏	❏	❏	❏	❏	❏	❏
2. I predict that I would use the mobile site through a device in future.	❏	❏	❏	❏	❏	❏	❏
3. I plan to use the mobile site through a device in the future.	❏	❏	❏	❏	❏	❏	❏
V. Perceived Self-efficacy							
1. I am able to use mobile commerce services without the help of others	❏	❏	❏	❏	❏	❏	❏
2. I have the necessary time to make mobile commerce services useful to me	❏	❏	❏	❏	❏	❏	❏
3. I have the knowledge and skills required to use mobile commerce services	❏	❏	❏	❏	❏	❏	❏
4. I am able to use mobile commerce services reasonably well on my own	❏	❏	❏	❏	❏	❏	❏
VI. Perceived Trust							

1. In my opinion, m- commerce is very reliable.	❑	❑	❑	❑	❑	❑	❑
2. I believe in the information that m- commerce provides.	❑	❑	❑	❑	❑	❑	❑
3. I can rely on M-commerce to execute my transactions reliably.	❑	❑	❑	❑	❑	❑	❑
4. Given the state of existing m-commerce, I believe that technology related errors are quite rare.	❑	❑	❑	❑	❑	❑	❑

Part 2: Please tick responses to the following questions as appropriate. Please complete all questions.

1. Sex

❑ Male ❑ Female

2. Age

❑ Less than 20 years-old ❑ 20-29 years-old

❑ 30-39 years-old ❑ More than 40 years-old

3. Education

❑ Junior High school ❑ High School ❑ College Degree

❑ Master ❑ Other

4. What is your monthly gross income?

❑ 0-$200 ❑ $200-$350 ❑ $350-$500

❑ $500-$750 ❑ $750-$1000 ❑ over $1000

5. How often do you use these services?

❑ Once a month ❑ Once a week

❑ Three times a week ❑ Everyday ❑ Never

6. If you use these services, when do you use them?

❏ For work   ❏ For school   ❏ For fun   ❏ Other

Thanks again for your helps!