Chapter 1: Introduction to the Study

1.1 Prologue

Electronic Commerce (EC) is well-known for the benefits that it offers society. The diffusion and adoption of EC, however, varies to a great degree due to macro-environment factors, as well as the existing situations relating to each business practice. These variations can be attributed to differences in infrastructure, market capabilities, Internet penetration and those factors inherent to individual business entities. Many studies have been conducted to understand these factors. In particular, EC adoption and diffusion is well researched within the context of developed countries. In the case of developing and emerging countries, there are limited data about EC acceptance and adoption. In addition, there is not sufficient evidence on frontier countries. Frontier countries are sub-sections of developing countries and are defined as economies that have the greatest potential to increase profits and obtain the highest returns on investment (Berger, Pukthuanthong, & Yang, 2011). Therefore, this study aims to explore the factors relating to EC adoption and key activities needed to achieve EC success in the case of frontier countries.

In order to understand EC adoption, this study focuses on Vietnam as a research context. Vietnam is classified as a frontier country by the Financial Times Stock Exchange FTSE (2015). Business to Customer (B2C) EC adoption in SMEs is investigated in the present study due to the identified gaps in the existing EC related studies. The selection of the SME sector is also attributed to the domination and the active role of the sector and its significant contribution to the national economy.

A multi-stage approach is implemented in this study. First, due to a lack of evidence pertaining to EC activities in frontier countries, a comprehensive literature review is conducted in order to identify specific guidelines and parameters for carrying out this research. Second, a review of theoretical models and empirical methods is conducted to provide the framework for empirical analysis. Third, a qualitative approach is used to conduct a meta-analysis of the information collected in Stage 1 and Stage 2. The results of this analysis support the contextualisation and the framework for quantitative analysis. Finally, using firm-level data, quantitative analysis is performed to understand the phenomenon of B2C EC adoption in Vietnam.

The remainder of this chapter provides the contextual background of the study, including the rationale and statement of the research problems, the aims and objectives of the present study, and an outline of the thesis.

1.2 Background

The Internet is an innovation that was originally developed as an experimental communication network of the US government to help in the exchange of information amongst a group of researchers (Turban, 2012). In the early 1990s the communication network expanded worldwide, and became popularly known as the World Wide Web (WWW), which has been widely accepted by users and has spread rapidly throughout the world (Turban, 2012). The success of this invention was noticed often by business men, as "weapons for competitive strategy", and it has been identified as a necessary prerequisite for conducting the contemporary mode of business (Tapscott, Ticoll, & Lowy, 2000, p. 23). Porter (2001, p. 73) states that enterprises have to consider the Internet as a means of supporting their existing business activities, rather than as a way of replacing them. Apart from creating effective communication within the companies, the Internet facilitates information sharing between business and trading partners (Damanpour & Jamshid, 2001). For example, Jones and Willis (2003) observed that many enterprises treat the Internet as crucial, due to its role in enabling the sharing of internal and external data within the organisations and with various stakeholders. As a result, the Internet has created a new way of conducting business for any enterprise, irrespective of its size and structure.

The model for conducting business via the Internet is known as Electronic Business (e-Business) or Electronic Commerce (EC). EC can be further classified into the following categories based on the parties taking part in transactions: Business to Business (B2B), Business to Government (B2G), Business to Customer (B2C), Business to Employees (B2E), Government to Government (G2G), and Customer to Customer (C2C) (Turban, 2012).

The economic contribution of EC sectors is varied and underestimated due to lack of evidence around the world. B2B EC is believed to contribute the largest transaction value of all the EC activities, followed by B2C. B2G-based transactions are still in their infancy in many countries, and the value of B2G activities has not been estimated because of the low level of implementation and documentation of B2G systems and activities throughout the world. The existing evidence also suggests that there is a great disparity between B2C transactions from developed countries, such as the US and European

countries, and Asian-Pacific countries in terms of economic contribution in the period 2011—2016 (Fredriksson, 2013).

Electronic commerce (EC) brings many advantages to customers, enterprises and society (Grandon & Pearson, 2004; Turban, 2011). EC enables customers to buy online and participate in auctions anywhere and anytime. It also provides much more choice of goods and services to buyers, as they can choose goods from various vendors anywhere in the world. Additionally, customers have the opportunity to design goods or services to suit their desires and choices. EC often offers cheaper prices to customers, as shopping online allow customers to shop around for the cheapest possible prices. With easy access to digital goods such as e-books and music, customers are able to download the products and services under consideration immediately once the payment is made to sellers. Furthermore, customers have the ability to assess appropriate product and service related information easily.

Moreover, EC offers many benefits to enterprises. It helps enterprises expand their market offerings globally. It also promotes cheaper costs for information processing, storage, and delivery, apart from cutting down the price of goods and services. The application of EC also improves the supply chain efficiency by decreasing delays, creating effective inventory storage, and appropriate management of other costs. EC strengthens customer relationships and facilitates customer services, as enterprises have the benefit of contacting their customers directly and building effective customer relationship strategies. In addition, EC allows for e-procedures that save time and money in transactions between companies and buyers. The allowance for customisation/personalisation also helps companies to focus on the specific needs of their customers. Finally, EC allows enterprises to conduct business online 24/7 without significant additional overhead costs. In conducting e-business, vendors can enter narrow market segments as well as global markets, where they are able to distribute their products widely (Napier, Rivers, & Wagner, 2005). EC fosters product quality and thus creates new methods for selling existing products (Chaudhury & Kuilboer, 2002).

EC also offers several benefits to society. It improves quality of life as it enables people to buy more and cheaper goods and services, irrespective of geographical location. It improves accessibility to products and businesses situated in regional areas, thus reducing the advantages that , traditionally, cities had. Similarly, customers in rural areas can take advantage of services such as education and health over the Internet. Furthermore, small

businesses may even be run from one's own home, thus facilitating the work-from-home concept.

EC adoption and usage, however, vary as a result of the different characteristics of the local regions, with regard to IT infrastructure, government policies, and the local culture and economy (Efendioglu & Yip, 2004). It is evident that EC development in developing countries is lagging behind the developed countries. Frontier countries represent the highest portion in the developing countries. Frontier countries are a subset of emerging markets (Berger et al., 2011), and are characterised by their relatively smaller size and the developing nature of the market economy. In many of these countries, private enterprises are less developed, and government enterprises play a significant role in conducting business commerce. The present study aims to explore EC in Vietnam, which is a frontier market with a significant regional population. The research offers an understanding of how SMEs adopt B2C EC in Vietnam, by identifying the critical success factors (CSFs) and barriers that promote or hinder the EC adoption and diffusion.

EC usage and development are emerging and low in Vietnam due to underdeveloped infrastructure, such as low levels of cashless payment, shortage of reliable logistic systems, low Internet usage in society, and lower quality of Internet services (Nottebohm, Manyika, Bughin, & Chui, 2012). Recently, more and more Vietnamese enterprises are gaining information about the benefits of Information and Communication Technologies (ICT) and embracing EC in their day-to- day business activities. However, customers and enterprises are still not confident about participating in EC because of the existing inadequate infrastructure and legal frameworks in Vietnam (Huy & Filiatrault, 2006; VECITA, 2010, 2011, 2012, 2013). Investment in e-business depends heavily on the organisational leaders' vision, as many online businesses aim to be pioneers in the market. Some enterprises use a number of EC forms, such as B2C or B2B, to inform partnerships or offer services and products to their customers. Without a proper business plan and risk analysis, however, they could end up creating business processes and Websites that are ill-prepared to make significant profits (The State Bank of Vietnam, 2009).

The level of EC development in Vietnam is seen to be far reaching its potential. Particularly in recent times, there is evidence that Vietnamese vendors and customers have started to conduct online businesses (VECOM, 2012). The proportion of enterprises accepting Internet orders is 33%, of which the figures for small and medium enterprises and large enterprises are 32% and 41%, respectively (VECOM, 2012). However, the available statistics indicate that only a very small percentage of customers use electronic facilities

(4%) (VECITA, 2010). Online businesses grew dramatically from 28% in 2007 to 48% in 2010 in two big cities in Vietnam, Hanoi and Ho Chi Minh (Cimigo, 2011). In addition, many innovative models are applied in Vietnam to overcome the underdeveloped infrastructure. Examples of these recent innovations include introduction of cash on delivery (COD), transferring money through mobile phone accounts (i.e. using mobile phones to send a message to its cellular network service, which in turn transfers the call balance from the buyer's phone account to the seller's account), and small-scale private courier services in big cities are replacing online payments and unreliable postal services (Nottebohm et al., 2012). According to the Vietnamese Government, the B2C EC had an annual turnover of approximate 700 million US dollars in 2012, and they estimated that this turnover could reach 1,360 million US dollars in 2015 (VECITA, 2012). The contribution of EC to Vietnam's economy is, however, very small compared to its potential. According to a report from McKinsey & Company, the Internet contributes only 0.9 % to GDP, even though 31% of the population has access to the Internet (Nottebohm et al., 2012).

Despite B2C EC bringing greater benefits to enterprises, achieving successful EC is not guaranteed, as enterprises frequently face a high risk of failure. The reasons attributed to the failure of enterprises vary and are often related to lack of profitability, excessive risk exposure, high cost of customer acquisition, poor performance, and static Website design (Turban, 2012). In this situation, the question of how an enterprise can regulate EC properly should be taken into account. Implementation of an EC project is intricate and requires substantial resources and effort. The enterprise has to identify and determine some key factors, or Critical Success Factors (CSFs), which minimise the identified risks (Deželak, Sternad, & Bobek, 2006), to ensure its success and avoid the pitfalls of adopting B2C EC (Esichaikul & Chavananon, 2001). In addition, CSFs can help an enterprise to develop strategic plans (Munro & Wheeler, 1980), to monitor its actions (Dickinson, Ferguson, & Sircar, 1985), and to improve its performance to achieve its goals (Feindt, Jeffcoate, & Chappell, 2002). An extant research about the survival of firms indicates that the success of new firms depends heavily on the start-up phases (Littunen, Storhammar, & Nenonen, 1998). Therefore, new firms should first analyse and identify the CSFs in order to reduce the chances of start-up failures and ensure their survival or success (Digman, 2003). In addition, enterprises need to continuously respond and integrate CSFs aligning to the existing market requirements, forces and ventures. Some illustrations of unbalanced strategies can be seen in good marketing but poor logistics; good logistics but unfocused efforts due to poor market research, and well-designed business plans but deficiencies in

practice. Such these unbalanced strategies lead to unsuccessful ventures in online enterprises (Elliot, 2002).

Rockart (1979, p. 85) is a pioneer in defining CSFs as "the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation". In other words, CSFs are some key areas that can guarantee the success of business activities if an organisation can achieve them**.** The CSFs for EC implementation might, however, be different due to the regional variations around the world. For example, the study conducted by Rahman (2012) that assessed CSFs in Singaporean companies, and the study by Pollalis and Hanson Frieze (1993) on USA companies, elicit some differences amongst identified CSFs. Sung (2004), similarly, found different perceptions of CSFs in companies in Korea, Japan, and the USA. The practical evidence shows that even experienced corporations, such as eBay and Google, failed in the new e-business environment because CSFs in the new environment differ from those identified within the corporate context (Liu, 2012). The EC models that are successful in developed countries should be modified to suit developing countries. For example, the cash-on-delivery model is used successfully in India, China, Vietnam, Thailand where credit payment systems are limited. In a case study about a successful company in Nepal (Thamel.com) conducted by Kshetri (2007), the author notes that the company conducts multiple EC models with many products and services in order to obtain profits and conduct successful online business transactions. This strategy is different to the strategy adopted by enterprises in developed countries. Given the differing nature of the evidence obtained in previous studies, this study aims to reconcile and gather additional evidence, particularly in the context of frontier countries, such as Vietnam.

1.3 Rationale and Statement of the Research Problem

There are a number of studies on EC practices in developing countries (Indjikian & Siegel, 2005) but most of those studies are in major emerging and developing economies, such as China, India, or Thailand (Huynh, Rowe, Truex, & Le, 2012; Pham & Teich, 2011). Frontier countries such as Vietnam and Cambodia are less studied. Moreover, from both technology and business viewpoints, these countries need to grow at faster rates to catch up with other emerging economies. Extant literature showcases the rapid growth of EC alongside the opportunities associated with EC in these countries. However, factors contributing to the adoption of EC in these countries, barriers that these enterprises encounter, and CSFs needed to reach success are required to be critically investigated.

In the case of Vietnam, there have been a few studies explaining EC adoption by using some models from developed countries. The samples range from organisations in service industries, like hotels, to art organisations. These studies applied theories, models and constructs from the literature to create integrated models. For example, there are studies that have used the Technology Acceptance Model (TAM) (Davis, 1989) to analyse how an enterprise uses EC (Hoang & Swierczek, 2008; Nguyen, 2007; Nguyen & Barrett, 2006). Other studies have employed the Technology-Organisation-Environment (TOE) framework (Tornatzky & Fleischer, 1990) and the Diffusion of Innovation (DOI) Theory (Rogers, 1995) to investigate some key determinants that influence Small and Medium Enterprises (SMEs) EC adoption decision in Vietnam (Huy & Filiatrault, 2006; Huynh et al., 2012).

There are also limited studies focusing on B2C practices and further evidence on how some companies can successfully implement B2C EC and overcome the underlying obstacles. In contrast, extant empirical evidence shows that there has been an accelerating growth of B2C EC in Vietnam in recent times. Meanwhile, the impact of ownership types that may have impacted on the successful conduct of B2C business in a transition economy has not be determined and needs further investigation (Huynh et al., 2012).

Therefore, this thesis is an attempt to provide an evaluation of B2C EC adoption in SMEs, an understanding of the means of facilitating the adoption, and the barriers to overcome in order to implement EC successfully in most frontier countries, with Vietnam as a research context. The research will offer guidance for SMEs to help them reallocate their resources to identify CSFs on a strategic basis and potentially prevent them from failing in EC ventures.

1.4 Research Questions and Objectives

1.4.1 Research Questions

In view of the problems identified above and the gap in the literature, this study will address the following research questions:

1. Is the extent of adoption of EC in Vietnamese enterprises measurable?
2. Can Vietnamese SMEs be segmented effectively on the basis of their EC adoption practices and on the extent of EC maturity dimensions?
3. Are there notable differences and/or similarities in the implementation of B2C EC amongst various SMEs in Vietnam?

4. What are the most important factors and barriers in implementing B2C EC in Vietnamese SMEs?
5. How do CSFs and barriers differ between SMEs in the Vietnamese economy with different ownership, enterprise size, and age?

1.4.2 Research Objectives

The main purpose of this research is to offer some understanding of the critical factors that determine the success of B2C EC initiatives and identify the barriers hinderingB2C EC adoption in Vietnamese SMEs. Accordingly, to answer the research questions, this study aims to:

1. Investigate EC adoption trends amongst Vietnamese SMEs.
2. Identify the Critical Success Factors (CSFs) and the barriers that determine and/or inhibit the adoption of B2C EC in Vietnamese SMEs.
3. Examine the typical firm level characteristics that influence the level of EC development in Vietnamese SMEs.
4. Analyse the differences and/or similarities in CSFs and barriers amongst Small and Medium-sized Enterprises based on the extent of EC maturity in Vietnam.

1.5 Contribution of the Research

The results of this research are expected to provide a step forward in understanding the obstacles that enterprises usually encounter when SMEs adopt B2C EC activities, and in the identification of CSFs. The findings obtained from this study are expected to contribute to formulating effective guidelines for implementing suitable EC practices for the owner-managers of SMEs, and offer critical directions for policy makers in formulating effective strategies for B2C EC development. In addition, this study contributes to the existing knowledge of B2C EC adoption, usage and maturity in frontier countries like Vietnam. Moreover, the findings obtained from this study are expected to support future research in other EC segments, like B2B, B2G, and social EC. The study is expected to provide fresh insights into the traditional technology adoption framework by way of integrating various theoretical models and analysing the key relationships between the influencing factors and the CSFs. Finally, the results obtained from this study will provide a transferable framework for application to other similar research contexts.

1.6 Outline of the Thesis

The thesis contains eight chapters. Following this introductory chapter, Chapter 2 presents a brief review of the various theoretic models used in the analysis of EC adoption and CSFs. A brief discussion of relevant literature on factors affecting B2C EC adoption and success is also presented. Accordingly, the adoption factors are classified into various categories: entrepreneurial, technological, organisational and environmental factors. On the basis of the synthesis of the review of the literature, some research hypotheses are formulated and also presented in this chapter.

Chapter 3 provides contextual background information pertaining to the existing EC practices and SMEs in Vietnam. The purpose of this chapter is to provide information to form the backdrop of the empirical analysis. Chapter 4 presents the research design and methodological framework for this study. The meta-analysis of CSFs are proposed due to the lack of evidence in a frontier country like Vietnam. The details of the pilot study, which is conducted to test the validity of constructs included in the questionnaire are also presented. Accordingly, discussion of the final questionnaire and the nature of the data collection are discussed.

Chapter 5 presents the results of meta and content analyses of CSFs identified from the literature and the qualitative study of CSFs and barriers in the Vietnamese context. A summary of the CSFs from the existing literature are reconciled and compared with those observed in the Vietnamese context. Chapter 6 summarises the results of the quantitative data analysis and outlines the rationale for conducting a positivist survey. The data collected from the in-depth survey is analysed using various statistical models to provide quantitative evidence with regard to CSFs and barriers to B2C EC.

Chapter 7 brings together a discussion of pertinent results obtained from the existing literature, the meta and content analyses and the quantitative analysis. The chapter provides a synthesis of theoretical and empirical evidence regarding the state and nature of B2C adoption in Vietnamese SMEs. Finally, Chapter 8 presents the theoretical, practical and methodological implications of the key findings of this study. Results obtained from the study will be summarised and avenues for further research will be presented.

As outlined above, the next chapter provides the theoretical evidence of the e-commerce adoption model, barriers preventing EC in developing countries and the context of the SMEs. In addition, the existing CSFs in the literature will be identified in Chapter 2, as CSFs are vital for guaranteeing successful implementation of EC ventures.

Chapter 2: EC Diffusion, CSFs, Barriers: Theoretical and Empirical Perspectives

2.1 Introduction

Chapter 1 presented the motivation, research objectives and research questions relevant to the present study. This chapter will discuss the various theoretical and empirical perspectives related to Electronic Commerce (EC) diffusion, Critical Success Factors (CSFs) to EC, and barriers to EC adoption and diffusion within the Business to Customer (B2C) context. First, B2C EC will be defined. Based on the EC definition, the two important stakeholders participating in the EC transaction process are the sellers (organisations or individuals) and the customers as users and/or buyers. The main objective of the present study is to explore and understand how customers decide to buy online and how sellers adopt and implement B2C EC. In order to understand these phenomena, this chapter aims to present various theories from the extant literature in order to explain EC adoption and diffusion processes from the perspective of both business and customers.

Many theories have been proposed to investigate information systems adoption and usage phenomena. Generally, these theories cover two themes. The first theme focuses on EC activities conducted at an individual level and explains how and why a person adopts an innovation and what factors influence their behaviour. The second theme focuses on EC adoption in organisations. Although the literature presents these themes in many contexts, the present study will mainly emphasise theories that are relevant to EC adoption at an organisational level. Additionally, maturity models will be discussed to examine EC development within an organisation. Factors impacting on EC adoption, EC implementation and EC maturity in organisations are also included. Existing studies related to ICT adoption in Vietnam are presented and discussed in detail. The outcomes of this chapter will provide basic guidelines to form the research framework for the present study.

2.2 EC Definition, Contribution and the Trends

According to the World Trade Organisation (WTO), EC is defined as "the production, distribution, marketing, sale, or delivery of goods and services by electronic means" (WTO, 1998, p. 1). Turban (2012) defined EC as the process of buying, selling or exchanging products, services, or information via computers, as well as servicing customers, collaborating with business partners, and conducting electronic transactions within an organisation. Therefore, EC can be interpreted as doing business via electronic

networks (Internet, Intranet, and Extranet). The Intranet is a network of computers within an organisation, whereas the Extranet is a network between organisations, and the biggest network is the Internet, which connects many computers throughout the world. In business, the actual shipping and receiving functions are conducted in the traditional way, but the rest of the processes (e.g. presenting the items available, selecting the items for purchase, creating invoices, tracking the item through the delivery steps) are carried out in electronic mode.

EC applications are useful in many contexts, such as B2B, B2C, and B2G, as explained in Chapter 1. However, the measurement of economic contribution of these categories is limited due to lack of official statistical information, lack of key indicators, lack of appropriate documents in developing countries, and the high cost of research (Fredriksson, 2013). The statistical figures for global EC contribution to the economy are still estimates. The biggest portion of the EC contribution to the economy is believed to be from B2B business, which is commonly referred as EC activities between businesses like a factory and a wholesaler, or a wholesaler and a retailer. Global B2B transactions make up 90% of all EC-based transactions. Revenue value was estimated at 12.4 trillion US dollars at the end of 2012 (International Data Corporation (IDC), as cited in WTO, 2013).

The following figure shows B2C EC sales from 2011 and the projection for 2016, and refers to businesses selling to individual customers. The IDC also estimates B2C revenue reaching 1.2 trillion US dollars at the same time (Figure 2.1). The most common products sold on the Internet include books, clothes, music, computer software, and other similar products, due to less need for tangibility and examination of the products when purchasing.

B2G transactions include EC between enterprises and the public sector. B2G applications relate to public procurement, licensing procedures, and other government-related operations through the Internet. A more efficient procurement system, known as e-procurement is still being treated as a pilot in many countries, and the market share of B2G is still small because of slow development of e-procurement systems throughout the world (WTO, 2013).

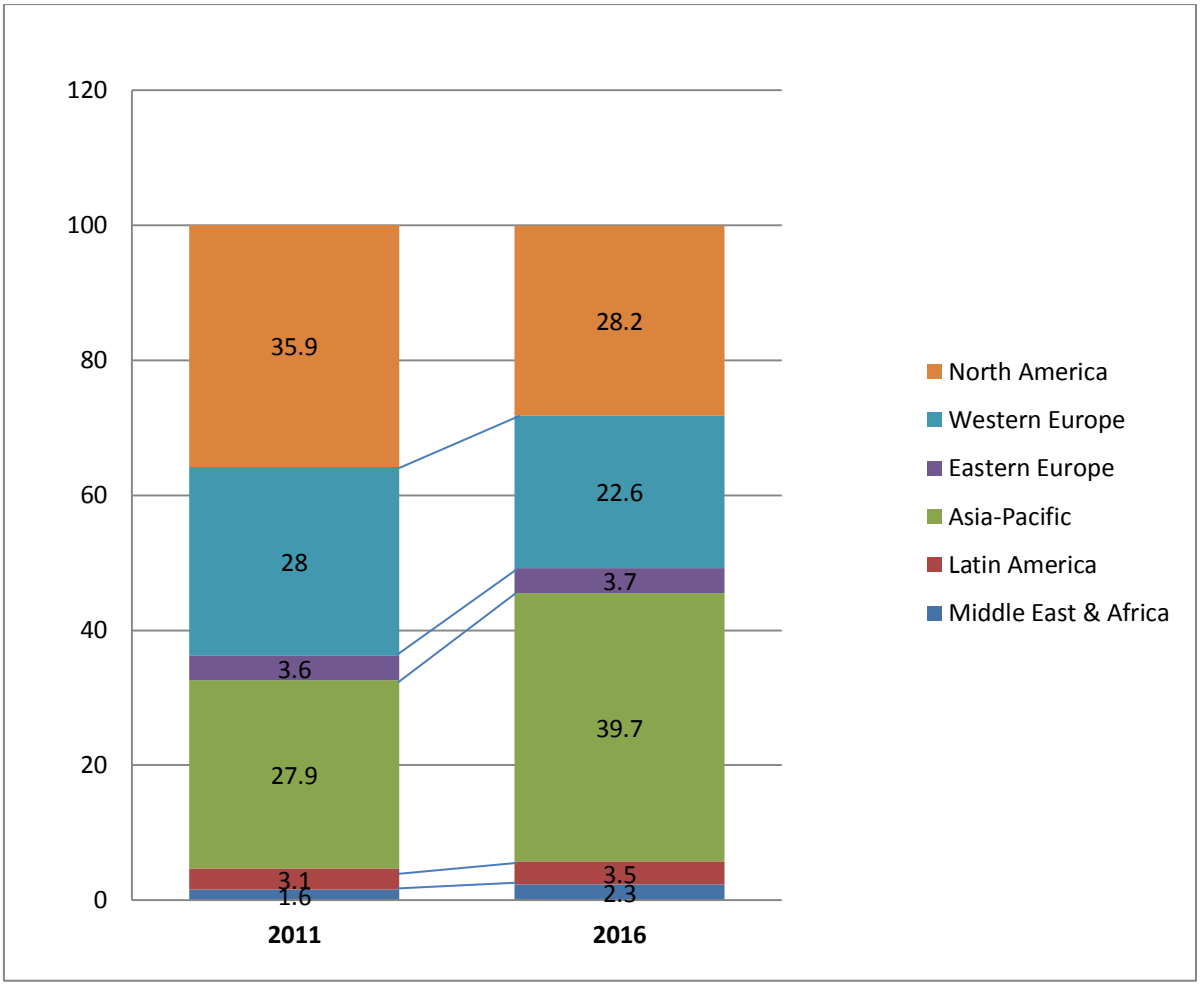


Figure 2.1: B2C EC sales trends by regions (2011—2016)
(Source: eMarketer, as cited in Fredriksson, 2013)

Although the Internet was introduced in the early 1990s, until 1995, the innovation of EC was attributed to the development of many innovative applications that enabled companies and corporations to be visible on the Internet and conduct business operations in an online environment. At that time, almost all US enterprises generated and developed their own Websites in order to inform their customers, business partners, and the public about their product and/or service offerings. The business world's attention changed from B2C to B2B in 1999, in 2001 it changed from B2B to B2E, collaborative commerce (c-commerce), electronic government (e-government), electronic learning (e-learning), and mobile commerce (m-commerce), and from 2005 to 2009 the EC was the emergence and use of Facebook commerce (f-commerce), where people started to use social networks for conducting business (Table 2.1).

Table 2.1: E-commerce trends

EC modes	Before 1999	1999—2000	2001—2004	2005—2009
B2C	X			
B2B		X		
B2E			X	
C-commerce			X	
E-government			X	
E-learning			X	
M-commerce			X	
F-commerce				X

X symbol indicating the presence of EC models

(Source: Researcher's own compilation)

EC will continue to grow in the future due to the increasing number of Internet users every year, complemented with the increasing usage rates of mobile commerce, and social networks such as Facebook, Instagram, Twitter (Turban, 2012). The publicly available recent statistics shows that the number of Internet users in the world was 500 million in 2001, increasing to 2,250 millions in 2011, whereas mobile users increased four-fold in the same period (International Telecommunication Union 2011, as cited in WTO, 2013). According to Microsoft tag (2012), there are 4 billion mobile phones in use, of which 27% are smart phones and 75% have Short Message Service (SMS) enabler. In addition, a 2013 online study conducted by Pew Research Center (2013) informs that 73% of adults who use the Internet social networking sites, and it is estimated that this figure will continuously increase in the future.

The following sections will present theoretical evidence to explain EC adoption and diffusion at the individual and organisational level.

2.3 EC Implementation at the Individual Level

From a social psychology perspective, there are many theories and models that investigate personal behaviours, such as the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), the Theory of Planned Behaviour (TPB) (Ajzen, 1985), the Decomposed Theory of Planned Behaviour model (Taylor & Todd, 1995b), the Technology Acceptance Model (TAM), an extension of the TAM model (Davis, 1989; Venkatesh & Davis, 2000) and the Diffusion of Innovation Theory (Rogers, 2003). All of

the aforementioned theoretical models are adopted widely in the Information Systems literature. These models typically consist of the dependent variables relating to the intention and actual decision of an individual towards using or not using the innovation, and various independent variables such as attitudes, social influences, facilitating conditions, ease of use or usefulness of an application.

The TRA model was proposed by Fishbein and Ajzen (1975) to determine the determinants of consciously intended behaviour. This model is widely accepted in social psychology research. According to the model, the performance of a person is determined by his/her behaviour intention (BI), and this construct is influenced by two variables: attitude toward behaviour (ATB) and subjective norm (SN) (Figure 2.2). BI is the level of a subject's intention to perform an analysed behaviour. ATB can be negative or positive on the basis of the target behaviour exerted by an individual. SN represents the expectations of important people that impact on the subject. However, this model has met with some criticism. For example, it is a general model, thus it is not able to determine the specific beliefs that impact on the analysed behaviour (Davis, Bagozzi, & Warshaw, 1989). The model focuses heavily on explaining intention rather than the behaviour of the individual (Lauver, 1992). Also, a research design that is developed based on the TRA model consumes a great deal of time, due to the need to identify the existing salient behaviours and normative beliefs in the analysed population (Poss, 2001).

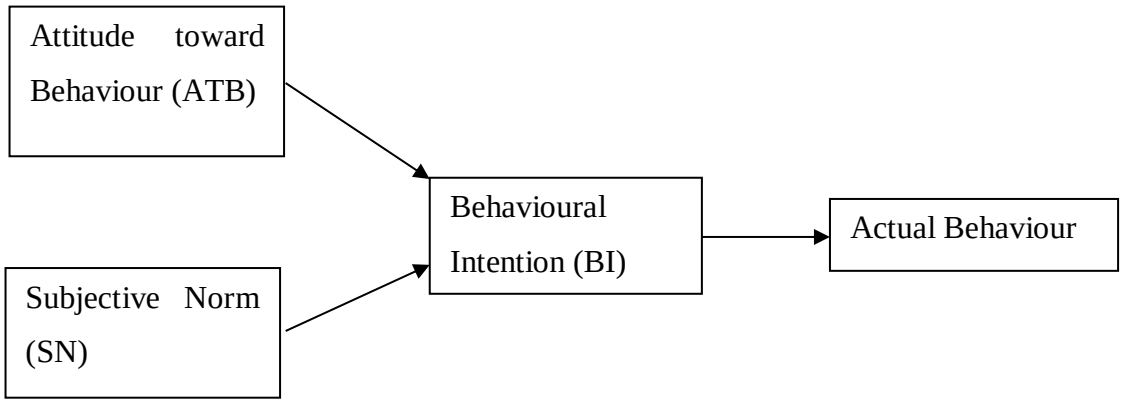


Figure 2.2: Theory of Reasoned Action (TRA)
(Source: Fishbein & Ajzen, 1975)

The TPB model is an extended version of the TRA, and is able to improve the accuracy of prediction when a subject is not in full volitional control (Ajzen, 1991). The TPB model has an added new construct named perceived behaviour control (PBC) (depicted in Figure 2.3). Perceived behaviour control (PBC) is defined as the perception of the analysed subject to understand his/her ability to perform the target behaviour. Many

existing empirical research studies suggested that the TPB model is able to calculate prediction better than the TRA model (Ajzen & Madden, 1986; Liao, Shao, Wang, & Chen, 1999). The TPB model is, however, criticised for focusing more on behavioural intention rather than on the individual's actual behaviour (Szmigin & Foxall, 1998) due to the prevailing assumption of the relationship between intention and behaviour, and the complexity associated with the measurement of the behaviour control construct (Manstead & Parker, 1995).

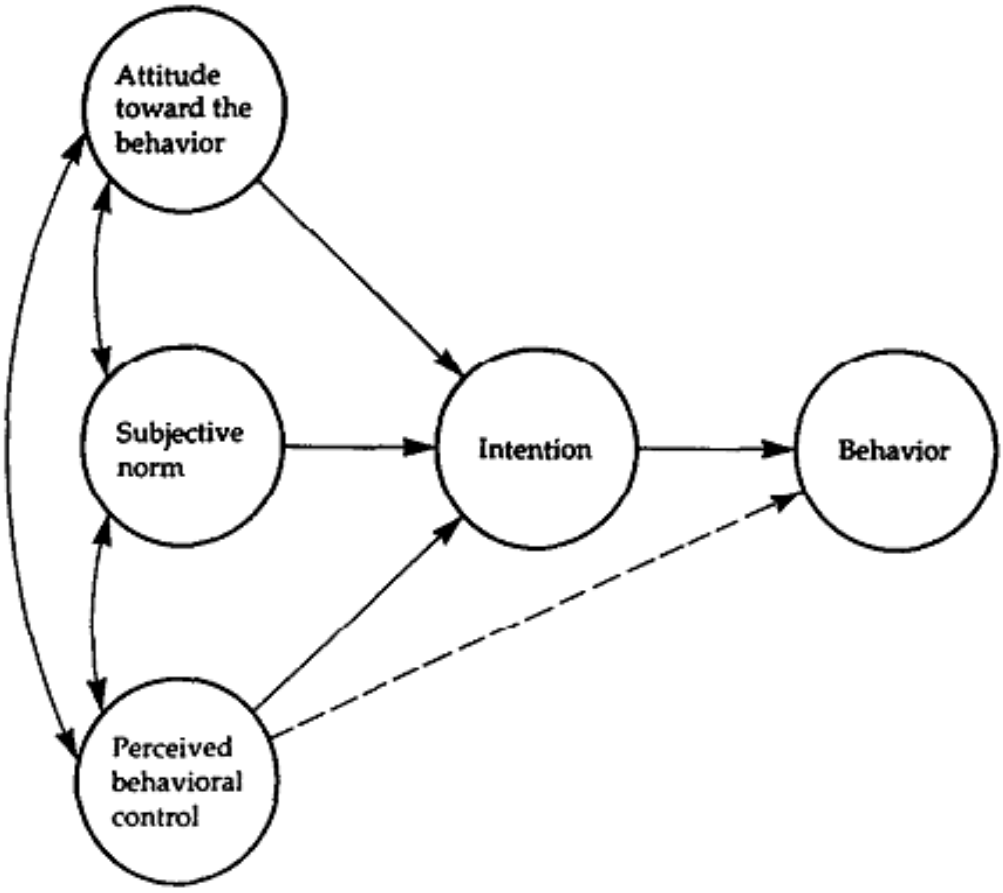


Figure 2.3: Theory of Planned Behaviour (TPB)
(Source: Ajzen, 1991)

One of the well-known models that aim to predict users' adoption of information systems is the Technology Acceptance Model (TAM). This model was proposed by Davis (1989), and it is based on the TRA. While the TRA model is used to explore behaviour, the TAM aims to explain the acceptance of Information Systems (IS). It is argued that the TAM not only predicts, but also provides interpretation of why a specific application may be adopted or rejected (Pham & Teich, 2011). The model also explains how external factors such as individual characteristics, working environment, organisation and information

system characteristics influence an individual's internal beliefs, attitudes and intention to use. The model consists of two belief factors: Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU). Perceived Usefulness refers to the extent to which a person thinks using an IS application increases his/her performance at work. Perceived Ease-of-Use mentions to what extent a person perceives that he/she can use and run the IS application smoothly (Figure 2.4). It is seen that PU impacts on outcome expectancy, while PEOU influences process expectancy, which impacts on both PU and the attitude towards using the system being studied.

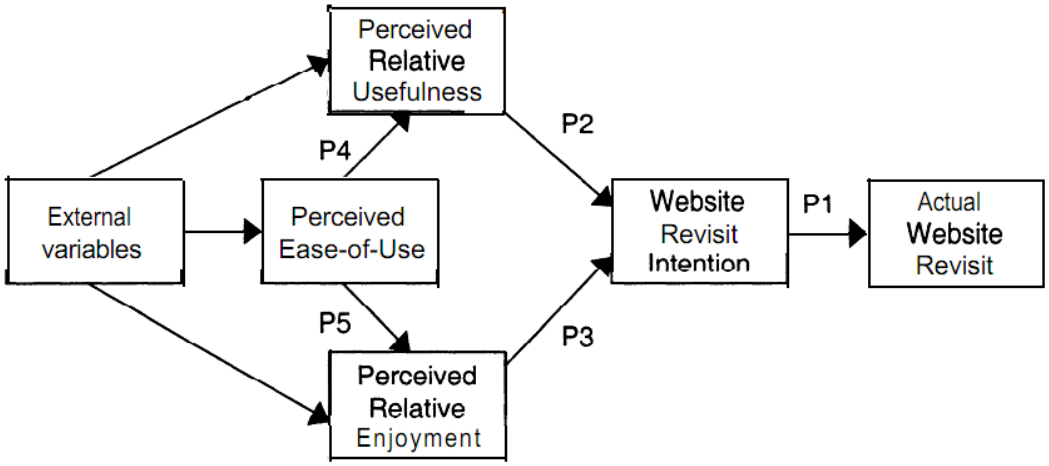


Figure 2.4: e-TAM

(Source: Van Der Heijden, 2000)

Since there was a lack of sufficient research evidence for understanding factors that influence PU and PEOU (Gefen & Keil, 1998), Venkatesh and Davis (2000) added some factors that exert an impact on the PU construct (Figure 2.5). They are organised into two categories: social influence processes such as subjective norm, voluntariness, and image; and cognitive instrumental processes like job relevance, output quality, result demonstrability and perceived ease-of-use.

Similarly, Venkatesh, Morris, Davis, and Davis (2003) reviewed eight models, namely, TRA, TAM, Motivational Model (MM) (Davis, Bagozzi, & Warshaw, 1992), TPB, Combined TAM/TPB (Taylor & Todd, 1995a), Model of PC Utilization (Thompson, Higgins, & Howell, 1991), DOI (Rogers, 1995), and Competing model of TAM (SCT) (Bandura, 1986) to create the Unified Theory of Acceptance and Use of Technology (known as UTAUT) (Figure 2.6).

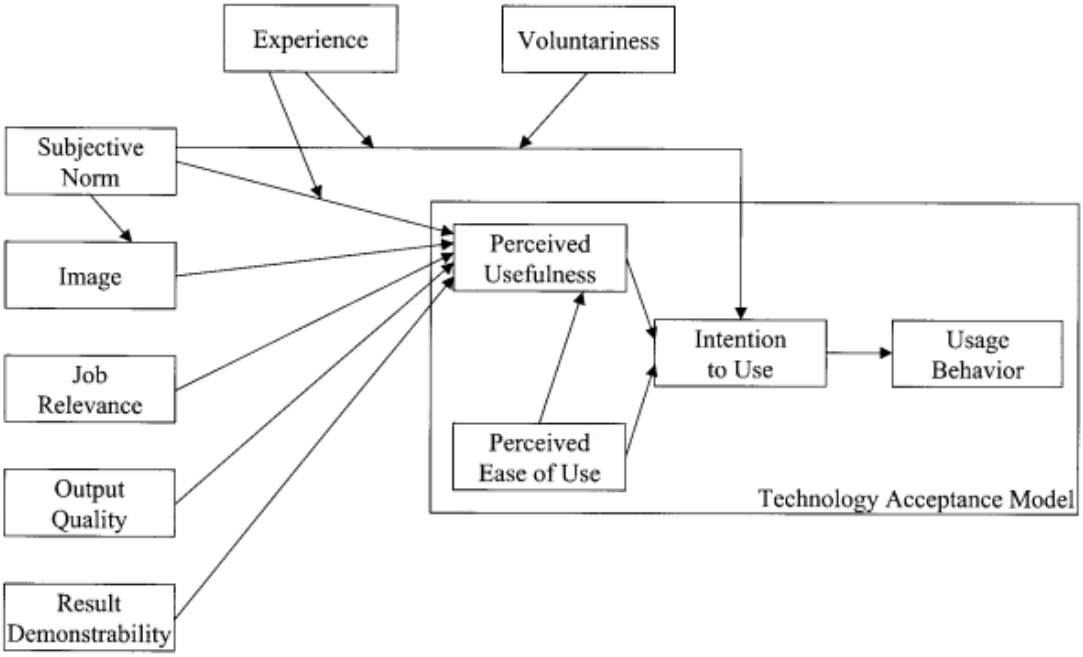


Figure 2.5: TAM2 - extension of Technology Acceptance Model
(Source: Venkatesh & Davis, 2000)

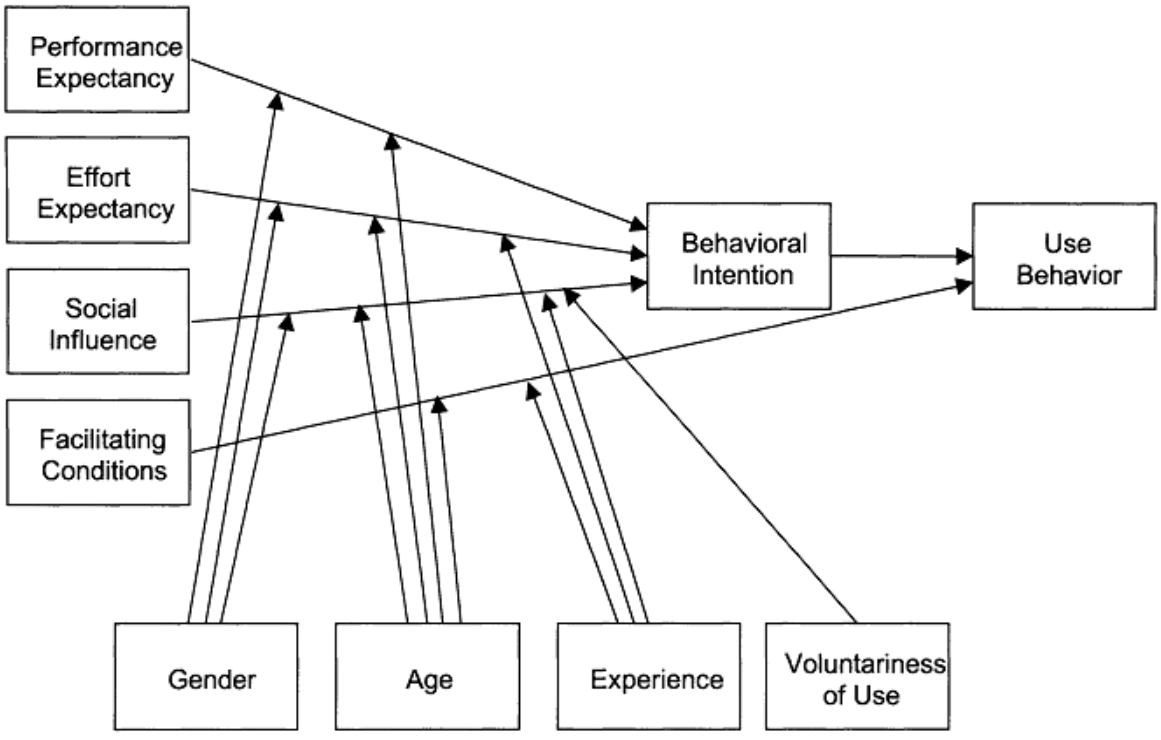


Figure 2.6: Unified Theory of Acceptance and Use of Technology

(Source: Venkatesh et al., 2003)

Although the above theories and models use many factors to investigate personal behaviour, there seems to be similarities among the theories presented in the preceding discussion. For example, based on the definition of constructs in these models, it is can be seen that the Perceived Usefulness factor in TAM is quite similar to the relative advantage factor in DOI. Similarly, the Perceived Ease-of-Use factor has a close relationship with the complexity construct in DOI.

These models have been employed extensively in scholarly research studies; however, they have met with some criticism. These models do not analyse non-voluntary technology adoption by individuals, although this occurs frequently in many organisation (Fichman & Kemerer, 1997). The second criticism is that the results based on using these models are inconclusive and often contradictory, as these findings are largely generated from adoption of the IS application by individuals in an organisation, and therefore cannot explain the process of the diffusion of the innovation through an organisation (Gallivan, 2001; Tornatzky & Klein, 1982). Another criticism is raised due to the characteristics of the IS application itself. In particular, adoption and implementation of IS does not only occur among individuals within the organisation, but also due to the competition from other organisations (Swanson, 1994). For instance, the adoption and implementation of IS and the Internet-based innovations often require adequate coordination and synchronisation amongst various business parties, such as trading partners, technology providers and stakeholders. Fichman (1992) reviewed 18 empirical research studies in a ten-year period, and his findings show that the results generated from these models were inconclusive in explaining the collective adoption of innovations in an organisation. Therefore, this study will focus on theories that investigate innovation adoption at the organisational level that align with the stated research goals.

2.4 Information Systems Adoption and Implementation at the Organisational Level

In the existing literature, a number of frameworks have been proposed to investigate organisational innovations. The published scholarly work includes studies conducted by academic researchers in many contexts (Ettlie, 1980; Fichman, 2001; Fichman & Kemerer, 1997; Kwon & Zmud, 1987; Meyer & Goes, 1988; Rogers, 1995; Zaltman, Duncan, & Holbek, 1973). However, this thesis will use Rogers (1995) framework of the Diffusion of Innovations Theory (DOI), due to its wider acceptance in IT and Internet-based innovation studies (Chong, Ooi, Lin, & Raman, 2009).

2.4.1 Diffusion of Innovation Theory (DOI)

The Diffusion of Innovation Theory (DOI) explains how an innovation is adopted by users in the society. According to Rogers (1995), various innovations are adopted by an individual as well as by an organisation. An innovation is an idea, practice, or object that is perceived as new by an individual or an organisation. Diffusion is the process whereby a new idea is communicated by certain channels over time among members in a social system. Communication channels are the ways through which participants share information. Communication channels consist of mass media and interpersonal channels. There are five stages in the innovation-decision process (Figure 2.7). The state of innovation diffusion depends on many factors, such as the characteristics of users as well as the characteristics of the innovation itself.

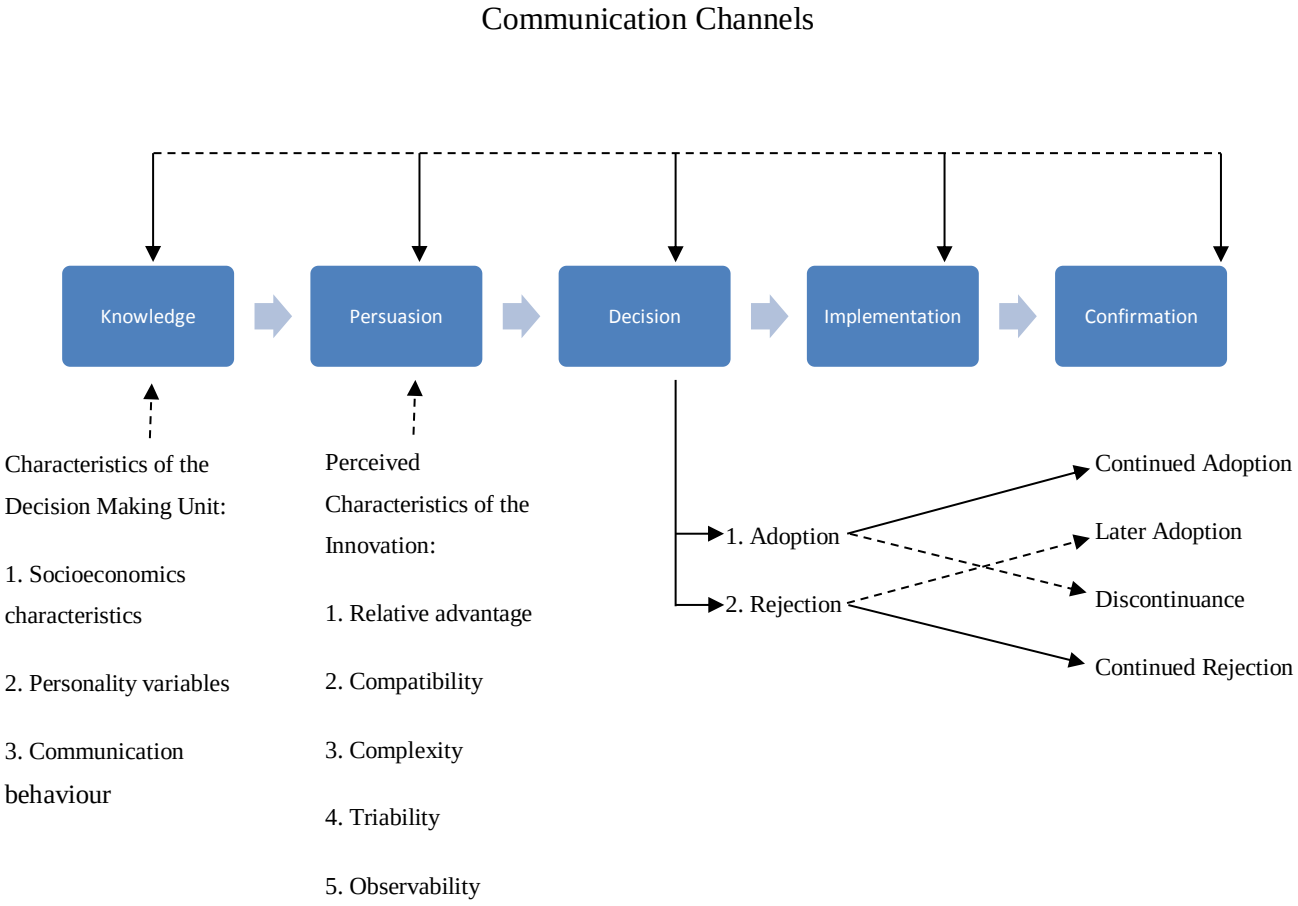


Figure 2.7: Five stages in the innovation-decision process

(Source: Rogers, 1995)

Knowledge is the first stage of this process. In this stage, the individual is exposed to an innovation's existence and gains some understandings of how it functions. This stage

is influenced by characteristics of the potential adopters, including socioeconomic characteristics, personality, and communication behaviour. Socioeconomic characteristics include level of education, social status, or the level of income. Personality characteristics are complicated because of the lack of appropriate measurement techniques. Communication behaviour relates to the number of contacts made by the change agents, and the individual's or the organisation's intention to seek new information.

Persuasion occurs when an individual forms a favourable or an unfavourable attitude towards the innovation. This stage is impacted on by five innovation attributes: relative advantage, compatibility, complexity, triability, and observability. Relative advantage refers to which the extent a new idea is perceived to be better than the existing idea. Compatibility is the extent to which a new practice is considered to fit with the situation of an individual or organisation. Complexity refers to the extent to which a new idea is perceived to be difficult and used by users. Triability refers to the extent to which an innovation can be tried by potential adopters on a limited basis before the actual adoption. Observability refers to the outcomes and practices, and the extent to which an innovation can be observed and communicated with individuals in a society.

A decision occurs when an individual or the organisation engages in activities that lead to a choice to adopt or reject the innovation. Implementation occurs when an individual or the business puts the innovation to specific use. Confirmation occurs when an individual or an organisation seeks reinforcement of an innovation decision that has already been made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation.

Diffusion of innovations in an organisation is much more complicated than the diffusion process that occurs at an individual level. At this level, the characteristics of the both innovation and the organisational aspects influence the process of innovation adoption. The innovation is re-invented to suit the state of the organisation, whereas the organisational changes will have a profound impact on its structure, strategies and culture.

The process of innovation acceptance can be divided into two main stages. The first stage is initiation, which is composed of two sub-stages: agenda-setting and matching. The second stage is implementation comprising three sub-stages: redefining/restructuring, clarifying, and routing (Figure 2.8).

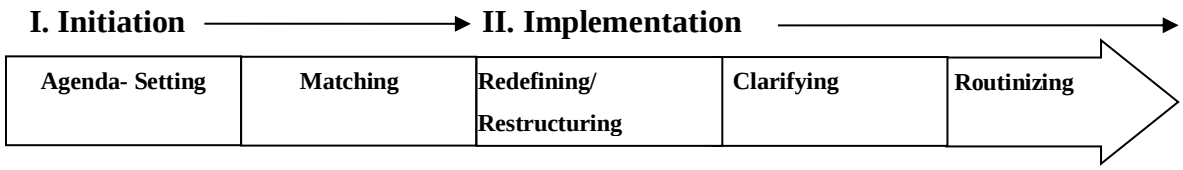


Figure 2.8: The innovation process in an organisation
(Source: Rogers, 1995)

The first step is an initiation which consists of two sub-steps: the agenda-setting stage and the matching stage. Rogers (1995) argues that the process always relates to two units of elements of adoption, which are the organisational and the individual levels, respectively. The former considers whether the adoption decision fits or does not fit the needs and goals of the organisation. The latter decision confirms the degree of success of the decision as a whole, based on the degree to which the individual behaves in the same way as the organisation.

Agenda-setting stage: This process occurs when the organisation tries to solve its problems. These problems are identified and then the solutions are sought by applying suitable innovations to fit with the organisation's situation.

Matching stage: At this stage, an organisation finds an innovation to solve its problems, and the innovation is perceived to be the one that can help the organisation to achieve its purposes.

Redefining/Restructuring stage: The innovation is re-invented and the structure of the organisation changes so that there is better alignment between the innovation and the organisational structure.

Clarifying stage: The innovation is to be used widely, not only amongst members in pilot stage, but also amongst other members in the organisation.

Routinising stage: The new idea is fully in use within the organisation's day-to-day activities.

Rogers (2003) suggested some specific characteristics that influence the diffusion of innovations in an organisation. These relate to individual leader characteristics, internal organisational structural characteristics, and the external characteristics of the organisation (Figure 2.9). Rogers (2003) claimed that innovation characteristics such as relative advantage, compatibility, complexity, trialability, and observability at the individual adoption level could be potentially influential at an organisational level as well. This statement was confirmed in a meta-analysis conducted by Tornatzky and Klein (1982).

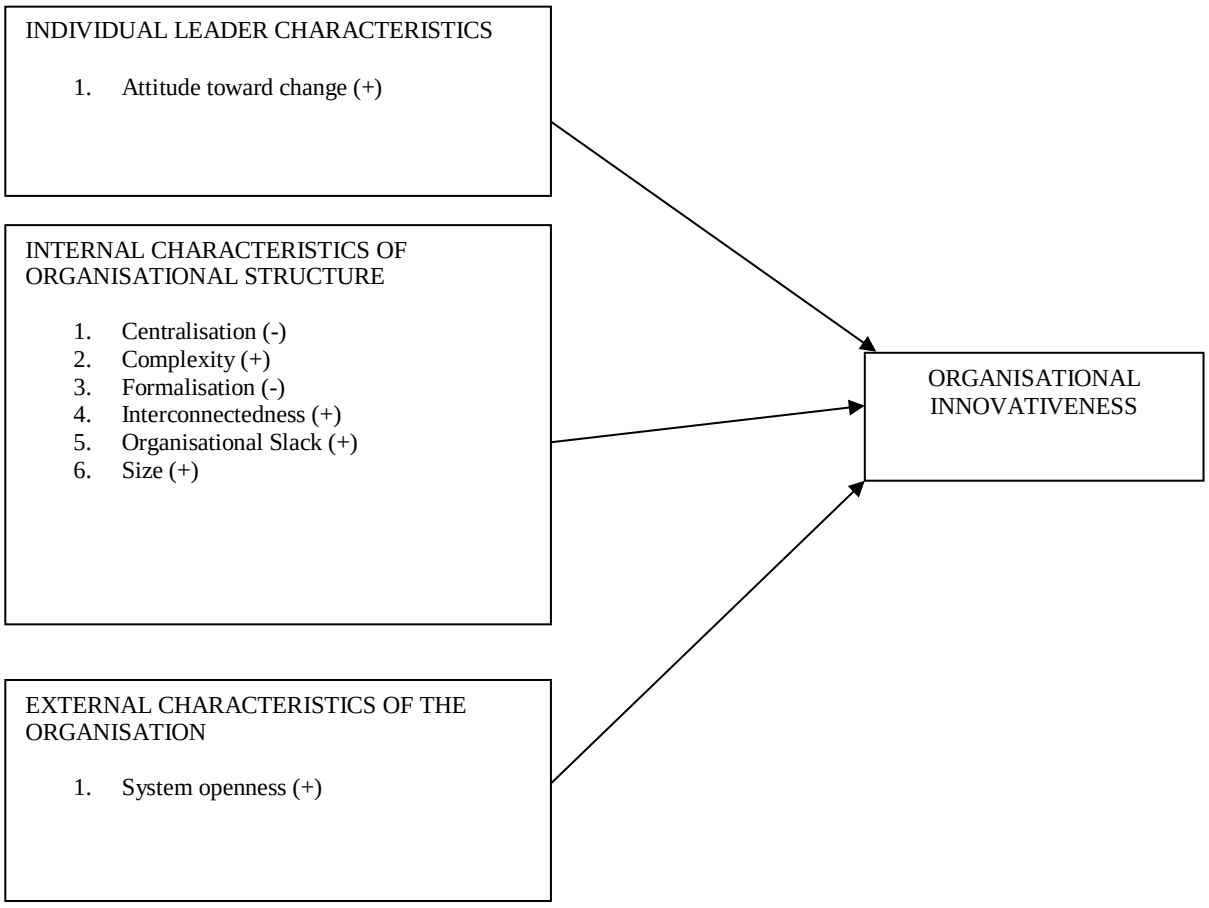


Figure 2.9: The characteristics that have an impact on organisational innovativeness.

(Source: Rogers, 1995)

Rogers (1995) summarised six components that relate to the internal characteristics of an organisation, and their impact on the adoption and diffusion process. These components relate to centralisation, complexity, formalisation, interconnectedness, organisational slack and organisation size.

Centralisation is recognised as how much the power and control are held with a few individuals within an organisation. This factor has a negative effect at the initiation stage, but a positive effect at the implementation stage of an innovation within an organisation.

Complexity is the extent to which members in an organisation have relatively high levels of education, income and occupation. Its impact on innovation adoption is positive at the initiation stage, but negative at the implementation stage (because of the difficulty of getting a consensus).

Formalisation is the extent to which the members in an organisation obey rules and procedures. This construct prevents the initiation process, but facilitates the implementation process within an organisation.

Interconnectedness is the extent to which an organisation possesses interpersonal connections in the form of networks in the society. It has a positive impact on the innovativeness of an organisation.

Organisational slack is the extent to which uncommitted resources exist in an organisation. This factor has been identified to have a positive impact on adopting new ideas within an organisation.

System openness is the extent to which members of an organisation have links to others outside the organisation. This facilitates innovation adoption within an organisation.

Although the theory has attracted positive reviews by many research scholars within the sphere of innovations and the diffusion process in organisations, the theory has still received some criticism. The research, which is based on DOI Theory application, only focuses on aspects associated with a specific type of innovation, but the process of innovation adoption within a business context may depend on other factors, such as interactions between the organisation, its market, and the subsequent innovation adoption. Tornatzky and Fleischer (1990) claim that the DOI Theory tends to stress the adoption decisions made by an individual, which poses problems when explaining the adoption process when the organisation adopts a complex technology that needs co-operation and coordination by many organisational members at different levels, rather than separate individuals. Gallivan (2001) showed that using the DOI Theory leads to inconsistent findings in some circumstances: (1) when the adopters are not volunteers, (2) when the innovation needs co-operation among adopters, (3) when the innovation may require the users to be trained extensively in order to apply these innovations for effectiveness, and (4) when there is a lack of commitment amongst members in the organisation. Therefore, existing research calls for improvement in the theoretical applicability of the DOI Theory to the business context, especially in terms of EC adoption.

In order to overcome these shortcomings, it is envisaged that the combination of the DOI Theory and the TOE framework will provide a holistic adoption model for investigating the adoption and diffusion of complex innovations in an organisation. The following section will discuss the Technology-Organisation-Environment (TOE) Framework.

2.4.2 The Technology-Organisation-Environment Framework

The Technology-Organisation-Environment framework (Tornatzky & Fleischer, 1990) is a valid theory for interpreting the processes of EC adoption and implementation at the firm level. This theory shows three aspects that relate to the adoption and implementation of technology in an organisation. These aspects relate to technological context, organisational context and environmental context. *Technological context* refers to the technologies an enterprise owns as well as available technologies in the market. *Organisational context* mentions the description of an enterprise, including the scope and size, the centralisation, formalisation, and complexity of its managerial structure, the strength of the workforce and slack resources. *Environmental context* alludes to bodies with which a firm does business, such as competitors, suppliers, and the government.

In order to understand how an enterprise adopts EC, an integrated model, which is a combination of various theories, is necessary (Oliveira & Martins, 2011). It means that the combination of two theoretical frameworks will provide comprehensive factors that impact on the processes of an innovation in an organisation. Existing research evidence shows that the combination of these models has provided an improved explanation of the EC adoption process in an organisation, including during and post-usage of EC (Zhu, Dong, Xu, & Kraemer, 2006). This integrated framework is deemed to be a suitable approach for exploring EC diffusion in a new research context like Vietnam, where B2C EC is emerging.

However, there is a range of studies that use different theoretical constructs that can categorise the TOE framework, a selection of which is included below.

2.4.2.1 Technological context

Through the lens of DOI Theory, many scholars have used some key characteristics leading to EC adoption, including relative advantage (Scupola, 2009), complexity, compatibility (Grandon & Pearson, 2004), trialability, and communication (Chong & Pervan, 2007).

Existing research studies have also used different factors to assess the state of acceptance of EC. For example, Grandon and Pearson (2004) used the *organisational readiness* construct from the *Iacovou* model (Iacovou, Benbasat, & Dexter, 1995), which has a sub-construct, '*technological resources to adopt EC'*, for evaluating how a SME in USA accepts EC. Similarly, in 2003, (Zhu, Kraemer, & Xu) employed *technology competence* from the *internal technology resource* model (Kwon & Zmud, 1987), which contained three sub-factors: IT infrastructure, Internet skills and e-business know-how. *IT*

infrastructure is the technologies available to a firm to conduct its business via the Internet, *Internet skills* reprent the skill-level of the workforce in using the Internet and related technologies, and *e-business know-how* refers to the entrepreneurs' skills, which are necessary for managing e-business in the cyber environment. Technology competence has also been used in some research (Oliveira & Martins, 2010; Zhu, Dong, et al., 2006; Zhu & Kraemer, 2005).

Technology integration, Web functionalities and *electronic data interchange* (*EDI) usage* (Hong & Zhu, 2006) have been to the other factors that are related to the technology context by many researchers. *Technology integration* refers to the distinctness of the Internet technologies and their integration with a firm's Website, and *Web functionalities* refer to the Web technologies that help an enterprise to strengthen the relationship between the firm and its customers and its trading partners (Oliveira & Martins, 2010; Zhu, Kraemer, & Xu, 2006).

Scupola (2009) proposed *perceived relative advantage* (Rogers, 1995), *perceived benefits and barriers* (Iacovou et al., 1995; Scupola, 2003) and *EC related technologies* (Scupola, 2003), to analyse SMEs in Australia and Denmark. *Perceived relative advantage* can be defined as how far an innovation is perceived as better than the method that it replaces. *EC related technologies* refer to available technologies in the market that are relevant to the firm's implementation of EC.

2.4.2.2 Organisational context

In the definition of an organisational context, *firm scope* and *firm size* are identified to be the most important factors that impact on the process of the enterprises' EC acceptance market (Zhu, Kraemer, et al., 2003). Firm scope is recognised to be how far an enterprise conducts its business in the market. This construct is also measured and presented by researchers using different terminology. Some studies use the organisational context variable to analyse firms' e-business capabilities (Zhu, Kraemer, et al., 2006; Zhu & Kraemer, 2005). Firm size includes some crucial aspects such as resource slack, structure of the organisation and the decision-making hierarchy in a firm (Zhu, Dong, et al., 2006). The number of employees in a firm determines the size of a firm. The firm size construct appears to be critical in the EC adoption and has been widely investigated in many studies (Oliveira & Martins, 2010; Zhu, Dong, et al., 2006; Zhu, Kraemer, et al., 2003; Zhu, Kraemer, et al., 2006; Zhu & Kraemer, 2005).

Organisational readiness, from the Iacovou model (Iacovou et al., 1995), is another factor that has been investigated widely in the process of EC acceptance. This construct consists of two variables, which are the financial and technological resources of an enterprise (Iacovou et al., 1995). There are many studies that have used this construct or its sub-constructs (Grandon & Pearson, 2004; Hong & Zhu, 2006; Iacovou et al., 1995; Oliveira & Martins, 2010; Scupola, 2009; Zhu & Kraemer, 2005).

Other variables of interest in the EC adoption process relate to *the strategic value associated to CEOs* (Grandon & Pearson, 2004; Subramanian & Nosek, 2001). *Managerial obstacle* (Mata, Fuerst, & Barney, 1995; Zhu, Kraemer, et al., 2006), *CEO characteristics* (Dholakia & Kshetri, 2004; Dinesh & Jaideep, 2001; James, 1999; Scupola, 2009), *support from CEOs* (Iacovou et al., 1995), and *employees' IS knowledge and attitude* (Dinesh & Jaideep, 2001; James, 1999; Sabherwal, Anand, & Chowa, 2006) have been widely cited in the existing literature as having an influence on the EC adoption process within an organisation.

2.4.2.3 Environmental context

In order to assess the impact of the environmental context on EC acceptance, studies in this area need to be examined.

Firstly, the readiness of customers is identified to be critical for a firm to be able to conduct its business. Zhu, Kraemer, et al. (2003) employed *consumer readiness*, which is created by combining *consumer willingness* with *Internet penetration*, to analyse e-business acceptance in European enterprises.

Secondly, pressure from competitors is a facilitator of EC adoption. This construct has been applied in existing research studies (Grandon & Pearson, 2004; Oliveira & Martins, 2010; Zhu, Dong, et al., 2006; Zhu, Kraemer, et al., 2003; Zhu, Kraemer, et al., 2006; Zhu & Kraemer, 2005).

Thirdly, the usage of partners is also a factor that facilitates EC adoption in a firm. Many studies consider this construct when investigating adoption of EC in an enterprise (Grandon & Pearson, 2004; Hong & Zhu, 2006; Oliveira & Martins, 2010; Zhu, Dong, et al., 2006; Zhu, Kraemer, et al., 2003).

Finally, the government plays a crucial role in the process of EC adoption in enterprises. Grandon and Pearson (2004) examine pressures from the government to adopt EC, which is identified as an external pressure construct. *Regulatory environment* is another aspect for analysing in the adoption phenomenon, as evidenced in Zhu's studies (Zhu,

Kraemer, et al., 2006; Zhu & Kraemer, 2005). Similarly, Scupola (2009) uses *the role of government* factor in her study that assessed EC acceptance in SMEs in Denmark and Australia.

The TOE framework, however, does not include interaction factors relating to trust and readiness of trading partners (Gibbs & Kraemer, 2004). There is also evidence that top management support can be studied as a single aspect, like technological, organisational, and environmental aspects (Al-Qirim, 2005; Grandon & Pearson, 2004). Therefore, this framework may need to be tested to refine it so that it can provide better explanations of EC adoption and implementation in enterprises.

2.5 Stage Models

Many studies in the past measured innovation adoption based on a single decision (e.g. adoption or non-adoption) (Zhu & Kraemer, 2005). This argument was noted by Premkumar and Ramamurthy (1995), as they noted that adoption decisions should consist of several stages, rather than the dichotomous choice. In order to provide a better explanation for the innovation process, many researchers have proposed alternate measurement metrics of innovation adoption (Table 2.2). In addition, research relating to Internet-based applications in business should look at the process of a technology cluster, rather than a single innovation (Parker & Castleman, 2007). The reason for this is that an enterprise can use different applications for their business purposes, including sales, payment processes, or online tracking. In EC adoption within SMEs, there is evidence showing that SMEs are able to embrace various EC applications, from the simple to the more complicated (Daniel, Wilson, & Myers, 2002; Quelch & Klein, 1996). For example, SMEs may use simple innovations such as e-mail or static Web for marketing purposes, or they may use integrated Websites and other information systems for all their business activities.

Table 2.2: Adoption measurement.

No.	Authors	Adoption Variable
1	James, Y. L. T. (1999)	Decision whether to adopt or not to adopt EC
2	Dinesh, A. M., & Jaideep, M. (2001)	Decision whether to adopt or not to adopt EC
3	Kevin, Z., Kenneth, K., & Sean, X. (2003)	Intent to adopt e-business
4	Grandon, E. E., & Pearson, J. M. (2004)	Decision whether adopt or not adopt EC
5	Dholakia, R. R., & Kshetri, N. (2004)	**Internet adoption level**: Based on the six phases identified by Kwon and Zmud (1987) 1. Pre-adoption: Owns at least a computer but no Web site. 2. Adoption: Owns a Web site but does not sell on the Internet. 3. Routinisation: Sells on the Internet
6	Hong, W., & Zhu, K. (2006)	**Adoption level:** 1. Non-adopters 2. Potential adopters 3. Adopters
7	Kevin, Z., & Kenneth, L. K. (2005)	**E-business usage** 1. E-business use (adoption) 2. E-business value (post-adoption)
8	Kevin, Z., Shutao, D., Sean Xin, X., & Kenneth, L. K. (2006)	**E-business usage** 1. E-business use (adoption) 2. E-business value (post-adoption)
9	Tiago, O., & Maria, F. M. (2010)	Decision whether to adopt or not to adopt EB
10	Zhu, K., Kraemer, K. L., & Xu, S. (2006)	**EB adoption level:** 1. Initiation stage 2. Adoption 3. Routinisation

(Source: Researcher's own compilation)

The majority of the existing studies found that the way to determine the adoption status of an enterprise is by interviewing the key-decision makers and determining their perceptions based on their situation and experience. For example, *the technology integration factor* can be perceived differently because of a variation in the degree of EC development, particularly between non-adopter versus adopter categories (Hong & Zhu, 2006). Similarly, Huy and Filiatrault (2006) identified Vietnamese SMEs' perceptions, and found that adopters and prospectors (those who plan to use EC within three years) perceive differently in terms of some influencing factors, such as perceived relative advantages, compatibility, and complexity. In order to reveal reliable information, the level of EC development should be taken into account when identifying the influencing factors of online business. Jones, Muir, and Beynon-Davies (2006) stated that stage maturity models are necessary for understanding and explaining the process, and to providing important guidelines for implementation and policy formulation. In other words, EC maturity models should be used to analyse the EC adoption phenomenon, as they normally consist of sequential levels (or stages) that determine the shape of the predicted, desired, or reasonable pathway from the initial state to maturity (Becker, Knackstedt, & Pöppelbuß, 2009). The full development of EC can be explained as maturity EC.

Maturity models have been applied earlier by many scholars when exploring the applications related to EC adoption (Bhabuta, 1988; Earl, 1983, 1989; Galliers & Sutherland, 1991; Gibson & Nolan, 1974; Hirschheim, Earl, Feeny, & Lockett, 1988; Nolan, 1973). According to Prananto, McKay, and Marshall (2003), Nolan (1973) with his proposed stage model is a pioneer in this field, and is widely accepted in the academic community. However, there were many concerns with the model, such as lack of empirical validation, lack of sufficient details and lack of adequate explanations. Many researchers followed Nolan's hypothesis and presented incompatible and disagreeing outcomes. Some scholars tried to improve Nolan's model by proposing different models, that were still based on Nolan's principles. These illustrations can be seen in models of Earl (1983), Bhabuta (1988), Hirschheim et al. (1988), and Galliers and Sutherland (1994).

Recently, with the development of Internet, Web-based applications, and EC, many stage models have been proposed that aim to investigate and explain a range of phases relating to complicated usage of IS/IT in the online business environment. These include the EC Maturity Model (KPMG, 1997), the Commitment-Implementation Matrix Model (Stroud, 1998), the E-Business Lifecycle Model (Berryman, 1999; Prananto et al., 2003), the six-stage model of Earl (2000), the EC Adoption Model (Daniel et al., 2002), and the

Stages of Growth for e-Business (SOG-E) Model (McKay, Marshall, & Prananto, 2000; Prananto, Marshall, & McKay, 2002). According to Fraser, Moultrie, and Gregory (2002), the maturity models have six components: (1) number of stages (generally from 3 to 6), (2) descriptions of each stage, (3) a summary of the characteristics of each stage, (4) a number of dimensions, (5) a quantity of basics or performances for each dimension, and (6) a description of each basic or performance as it might occur at each stage of maturity. These models classify EC adoption stages with different terms, but all of these models agree that the higher stages are more complicated and beneficial than the previous stages.

In addition, with various existing stage models, a study by Mettler and Rohner (2009) on maturity models shows that there has been a sharp increase in the number of maturity models since 2000. However, the selection and evaluation of an appropriate model that is applicable to a particular situation and specific context is still difficult. In order to address this problem, Jones et al. (2006) proposed a comparative framework to evaluate e-business models for SMEs. They identified 65 stage models in academic and non-academic literature. These models were analysed through their own framework, which included eight elements: *perspective*, *development*, *emphasis*, *verification*, *barriers*, *focus*, *source*, and *stages*.

The four common *perspectives* identified are: technological, industry, business-based and evolutionary development. The technological development perspective refers to the development of IT/ICT applications, and industry perspective mentions the e-business usage. Business-based perspective refers to suitable market strategies, whereas evolutionary development is a record of milestones of e-business growth. *Development* identifies whether the frameworks have a linear or a non-linear structure. Linear frameworks are recognised by reference to stages or levels within their frameworks, or diagrammatical evidence of a staged development structure, while non-linear frameworks illustrate enterprise growth without any separation. *Emphasis* alludes to three types of business analyses with models such as SMEs, Large Enterprises (LE) and Non-Specific (NS) enterprises. *The verification factor* is determined by empirical studies that support various models, *barriers* identify the existing obstacles in an analysed model. *Focus* mentions the range of models such as EC, e-business, or non-specific business, and *the source factor* consists of the sub-factors: source sector (public sector, private sector and academic area), source analysis (original sources of the model such as journal, Website), and originator (authors' disciplines). Finally, *stages* refer to the number of development levels within an enterprise.

Jones et al. (2006) also showed that there was a lack of models that explored and investigated barriers to implementing EC in the existing models. Four years later, in order to investigate the e-business of Portuguese SMEs, Gonçalves, Santos, and Morais (2010) applied the framework of Jones et al. (2006) to analyse eight of the most cited models in the literature, and found that the SOG-e Model (McKay, Marshall, et al., 2000; Prananto et al., 2002) is the most widely used and vigorously tested model among the available models.

The SOG-e Model is an improvement on the stages of growth model by Galliers and Sutherland (1994) and is combined with the Internet Commerce Maturity Model (McKay, Prananto, & Marshall, 2000) to avoid criticism that the model has too a strong focus on IT, rather than testing the relationship between IT and other business activities. The model contains six stages:

- Stage 1: no online presence
- Stage 2: static online presence
- Stage 3: interactive online presence
- Stage 4: Internet commerce
- Stage 5: integrated organisation
- Stage 6: extended enterprise

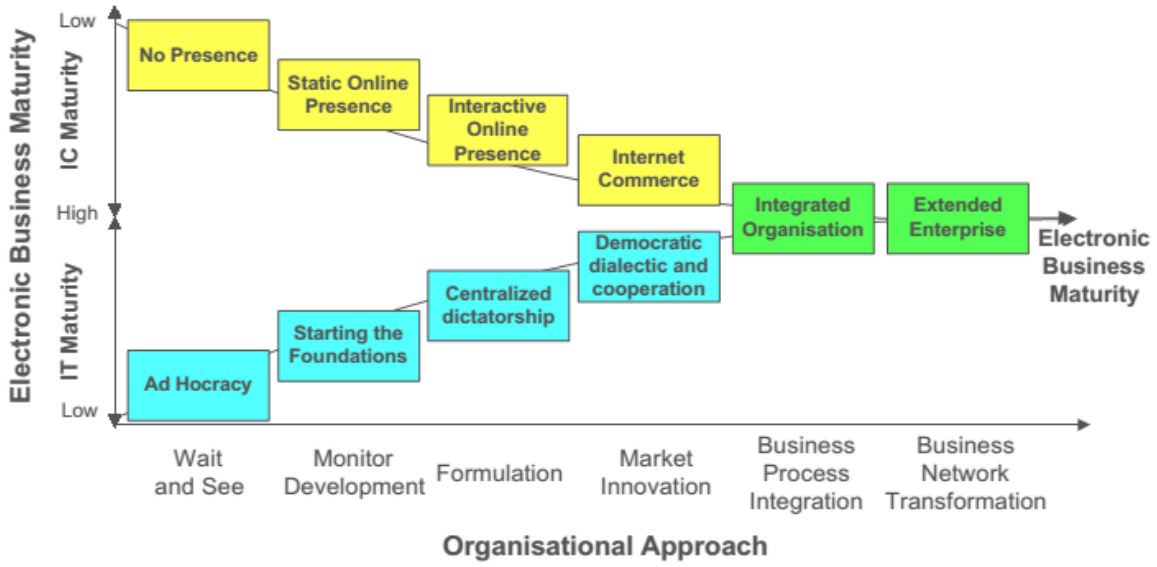


Figure 2.10: The SOG-e Model
(Source: McKay, Marshall, et al., 2000)

The y-axis describes the level of maturity. For IS/IT maturity, the range in the bottom half of the y-axis shows the increase in maturity level, while the range in the top half of the y-axis describes the growth of Internet commerce maturity. The meeting point in the centre of the figure illustrates the most mature level of e-business, particularly stage 5

and stage 6. The x-axis shows the cumulative stages. From stage 1 to stage 4, an enterprise can belong to two different stages in IC and IT maturity. For example, a company can be at stage 4 of the IC maturity level, but its IT maturity level may be at stage 2, stage 3 or stage 4, or vice versa. Furthermore, enterprises can start at or jump to any stage based on their circumstances, such as importing packages and/or skilled personnel.

In stage 1, there is no clear direction for the enterprise's Internet business plan. In stage 2, e-business plans are increasingly considered to be an important component of the organisation's business; however, no proper planning is stated and there is a lack of direction for IS/IT development and implementation. In stage 3, enterprises consider the e-business plan as a critical factor for their business activities, as it showcases a clear relationship between e-business plan development and the organisation's inner activities. However, this stage largely focuses on the technology-centric perspective and is not influenced by business goals. In stage 4, enterprises focus more on EB adoption and development in terms of business perspectives, integration and coordination between the elements of e-business (e.g. IS/IT and IC) and the enterprise's business processes are more improved. At the next level, there is smooth communication and flow of processes between organisations resulting from integration between traditional business and e-business in terms of processes and activities. In the last stage, every facet of an enterprise relies on e-business due to the powerful integration of the enterprises internal processes and its external activities with their suppliers and partners. The main task of the e-business plan is to build and maintain an enterprise's strategic advantage.

Each level of EB maturity is measured by four dimensions: e-business strategy, e-business system, staff arrangement, and impact on business processes (Prananto et al., 2003). The SOG-e Model developed in 2000 has been applied in the Australian companies to confirm its reliability and validity (Prananto et al., 2003; Prananto, McKay, & Marshall, 2004). Although the SOG-e Model was designed for developed countries, the criterion for each stage is quite descriptive making it easy to apply this model in other countries. For example, Molla and Licker (2004) applied the SOG-e Model to investigate EC adoption in developing countries, with South Africa as a case study. They employed six stages to describe EC maturity:

1. Not connected to the Internet, no e-mail.
2. Connected to the Internet with e-mail but no Website.
3. Static Web that is publishing basic company information on the Web.

4. Interactive Web presence that is, accepting queries, e-mail, and form entry from users.
5. Transactive Web, that is, online selling and purchasing of products and services such as customer service.
6. Integrated Web, that is, a Website integrated with suppliers, customers, and other back-office systems that allows most business transactions to be conducted electronically.

However, the maturity models have attracted some criticism. First, these models consider the adoption of Internet technologies to be too simplistic (Jayasuriya, 1993), thus they do not reflect the complexities associated with the integration of changes in an organisation (Parker & Castleman, 2009). In the context of SMEs, the models do not describe the great variation in regard to technological requirements as a result of each SMEs' unique situations(Drew, 2003). Many SMEs also do not have an opportunity to apply the advanced stages proposed by the model due to the nature and type of business that they conduct (Levy & Powell, 2003). The second problem relates to the assumption of gradual incremental adoption and usage of the Internet for business activities. Some evidence shows that there is a decrease in ICT adoption over the time in many SMEs (Alonso Mendo & Fitzgerald, 2005). All of this discussion leads to the need to improve stage models to provide a comprehensive explanation of EC adoption in the context of SMEs.

2.6 Factors Impacting on EC Adoption and Performance

2.6.1 Misuse of Factors in the Existing Literature

The existing literature shows that there is an overlap in the use of factors that impact on EC adoption. This notion is strongly attested by some researchers (Harrison, Mykytyn Jr, & Riemenschneider, 1997; Wymer & Regan, 2005). The research refers to these factors that influence EC adoption as either accelerators, determinants, drivers, enablers, motivators in their studies(Chau & Hui, 2001; Chen & McQueen, 2008; DeLone, 1988; Keeling, Vassilopoulou, McGoldrick, & Macaulay, 2000; Levy, Powell, & Worrall, 2005; Teo & Pian, 2003; Wang & Pho, 2009). Yet other researchers considered these factors to be barriers or inhibitors (Prananto et al., 2004; Touray, Salminen, & Mursu, 2013). These factors thus appear to create a positive or a negative value in the research model in quantitative studies. However, the role of these factors is relative. For example, in a certain

type of research study, a factor can be identified as a barrier in a sub-population but might be regarded as a accelerator in another sub-population (Wymer & Regan, 2005).

Another misuse of the terminology related to factors in the existing literature is attributed to the identification of facilitators/enablers/best practices and success factors/critical success factors (Wilson, Daniel, & Davies, 2008). This misuse can be explained by the fact that researchers assume the benefits of an adoption to be linear to the development of innovations. In fact, regarding SMEs' attitudes toward EC adoption, the evidence shows that many SMEs first adopt a range of applications, then decide which innovations are suitable for their business purposes (Levy & Powell, 2003, p. 179). As a result, many SMEs may have the same level of EC usage, but the benefit achieved from these applications may be different amongst the adopters. This behaviour may be true in case of Vietnamese SMEs that are willing to take a high risk (Thai & Swierczek, 2003).

Therefore, in the current study, the factors that need to be considered in EC adoption are classified into two categories. The first category are factors that are barriers/drivers that have an impact on EC adoption or EC development. The second category consists of factors that influence the outcomes of EC activities.

2.6.2 Barriers to EC

2.6.2.1 Barriers from DOI Theory

The DOI Theory identifies some barriers that may exist in the process of innovation adoption. At the first stage, the initiation stage, the organisations identify problems and needs, and also find suitable applications in their technological market to solve the identified problems. In that case, an immature technology market may pose several obstacles for the organisation. Some observations show that many SMEs cannot find suitable technology providers offering EC solutions that will fulfil their business goals at an affordable cost (Lockett & Brown, 2006). This factor has been empirically tested to understand its impact on EC adoption (Wilson et al., 2008). However, the DOI Theory does not include the availability of technology providers/experts. In the following matching stage, where SMEs might find some kind of EC solution, they estimate the complexity of EC solutions in relation to their existing condition. Therefore, compatibility with their existing business conditions may play a more important role in this process.

In the second stage (i.e. implementation stage), when SMEs decide to adopt a certain type of EC solution, the structure of their existing business practices and the original nature of the solution will be changed to fit together (e.g. business resource planning,

online training, change management). As a result, the compatibility of existing practices, change management, consultant involvement and support of the technology providers all have a strong impact on the EC implementation process, as has been identified in many studies (Caldeira & Ward, 2003; Thong, 2001; Wilson et al., 2008).

The next section will review factors that prevent EC adoption in an organisation in the context of SMEs, and in developing countries. The reason for reviewing this research trend is because there are limited studies about Internet usage in Vietnam. Therefore, it is well perceived that these factors may inhibit the Vietnamese SMEs from the application of the core concepts of Internet business.

2.6.2.2 Barriers to EC adoption

Barriers in developing countries

Kshetri (2007) discussed barriers to EC that can be classified into three kinds: economic, socio-political and cognitive factors. These inhibitors prevent customers and enterprises from adopting EC.

Economic factors include slow Internet diffusion, unavailability of credit card, payment facilities, logistic system related deficiencies and low bandwidth. These infrastructural and market characteristics influence the availability of ICTs due to slow Internet diffusion. For example, lack of electrical supply and lack of purchasing power and low levels of teledensity in Tanzania have resulted in low usage of the Internet in many rural areas (Mercer, 2006). In addition, manufacturers of ICTs focus only on large distributors situated in developed world (Gatignon & Robertson, 1985; UNDP, 2007). Online payment is another problem; for example, 35-40% of transactions in Asia are on the basis of cash payments only (David Biederman, 2000, as cited in Kshetri, 2007).

Traditional economic sectors in developing countries, like agriculture, have limited Internet usage because the Internet contributes only a small cost saving (2%) in those areas, but in contrast, it contributes 40% of the electronic components (Coppel, 2000). The physical delivery systems in developing countries are underdeveloped. Setting up and running advanced logistic systems is found to be very difficult in many developing countries (Hawk, 2004). Moreover, existing low bandwidth poses problems for adopting EC (Kshetri, 2007).

Socio-political factors are deeply associated with formal and informal institutions. Informal institutions include social obstacles. For example, businesses in Asia focus on personal relationships, so Internet-based relationship management can threaten

interpersonal networks. Also, business communities in many developing countries prefer personal face-to-face communications to Internet communications such as e-mail, which inhibits EC adoption. Formal institutions include political connections. Laws to accept digital and electronic signatures have not been widely introduced in many developing countries. Also, in some developing countries, ICT is considered to be a luxury, so these countries have tariff policies that make importing ICT very expensive (UNCTAD, 2000). Weak laws also reduce consumers' trust and intention to purchase online (Kenny, 2003b). As an example, a Brazilian consumer study showed that EC adoption depends on the laws, including concern about privacy and security, lack of business laws specifically for EC, weak legal protection for buying online, and taxation on the Internet (Tigre & Dedrick, 2004). Similarly, some studies in China also show that weak rules impact on customers' trust, thus slowing EC diffusion (Efendioglu & Yip, 2004; Gibbs, Kraemer, & Dedrick, 2003).

Cognitive factors allude to the people who take part in EC activities, such as customers and individuals in business. General and computer illiteracy and shortage of English language skills in the population have been determined to be the most common barriers to adoption of EC (Kenny, 2003a). Furthermore, lack of local language on the Websites poses a problem for customers (Nunberg, 2000). In addition, there is a lack of awareness of EC benefits, and confidence in service providers. On the other hand, at the business level, there is a shortage of people with EC expertise and knowledge who can use ICT profitably. Moreover, a high level of risk aversion also contributes to slow EC adoption (Kshetri, 2007).

However, Molla and Heeks (2007) claimed that existing research about e-commerce in developing countries focuses on concept development rather than empirical evidences. Thus, many studies tend to investigate determinants or barriers, and largely neglecting research related to the consequences of the adoption of EC for achieving benefits. Therefore, this thesis aims to partly fulfil this gap.

Barriers in SMEs

Researching the barriers to EC usage aims to explain why the level of e-commerce adoption in SMEs is at a certain development stage. The reasons for low diffusion of EC among SMEs are well documented in the existing academic literature (Sheth & Ram, 1987). The most common barriers that prevent SMEs from adopting EC vary due to their characteristics and environments. Chitura, Mupemhi, Dube, and Bolongkikit (2008)

reviewed studies about obstacles related to EC adoption by SMEs from the early 1990s to 1999 and from 2000 to 2008. They found that the barriers that existed in both of these periods were essentially the same. Any differences were the result of the type of SME, the region, and the level of EC maturity (Table 2.2), as evident in the Kartiwi and MacGregor (2010) study. The research reviewed also indicated that new research focusing on EC adoption should stop re-creating or re-inventing any new obstacles, and efforts should be directed to providing relevant information that actually helps SMEs to overcome obstacles and achieve success. Based on this, the present study will examine barriers in Vietnamese SMEs and identify key factors that will allow them to gain benefit from EC activities.

Table 2.2: List of barriers from 2000 to 2008

Barriers to e-commerce	**Sources**
Lack of suitable EC solutions for SMEs	Khan (2004), Kapurubandara and Lawson (2006)
Problems in solving compatibility issues with existing IT system	Khan (2004)
Difficulty in changing the existing working procedures or practices to match with EC adoption	Khan (2004)
Inadequate transportation and delivery	Dedrick and Kraemer (2001)
Limited diffusion of computers	Dedrick and Kraemer (2001)
Lack of online payment process	Dedrick and Kraemer (2001)
Limited availability of banking services	Dedrick and Kraemer (2001)
Uncertain taxation rules	Dedrick and Kraemer (2001)
Limited knowledge of e-commerce models and methodologies	Cloete, Courtney, and Fintz (2002)
Lack of access to computers	Cloete et al. (2002)
Lack of access to hardware and software	Cloete et al. (2002)
Lack of time to investigate options	Cloete et al. (2002)
Lack of information options	Cloete et al. (2002)
Difficulty finding and retaining qualified personnel with required skills and knowledge	Kaynak, Tatoglu, and Kula (2005)
Risk of dissipation of company specific knowledge	Kaynak et al. (2005)
EC is a distraction from core business	Brown(2002), Scupola (2003)
Lack of strategic vision	Brown(2002)

Continue in next page

Table 2.2: Continued.

Barriers to e-commerce	Sources
Company markets need high degree of human interaction	Bolongkikit, Obit, Asing, and Tanakinjal (2006)
Too many junk e-mails	Scupola (2003)
Technological change and evolution	Scupola (2003)
Lack of external pressure from suppliers and customers	Looi (2004)
Not sure how many people are using the Internet	Lawson, Alcock, Cooper, and Burgess (2003)
Customers have not asked for it	Pracy and Cooper (2000)
Belief that all customers are local	Pracy and Cooper (2000)
SMEs not prepared to adopt EC as a business concept	Lane, Van der Vyver, Delpachitra, and Howard (2004)
Limited use of Internet banking and Web portals by SMEs	Lane et al. (2004)
Web based selling of goods/services is not yet practical	Lane et al. (2004)
No resources for experimentation	Taylor and Murphy (2004), Dixon, Thompson, McAllister, and Britain (2002)
Some SMEs occupy small niche markets that do not need global connectivity through the internet	Taylor and Murphy (2004)
No simple procedures and guidelines	Kapurubandara and Lawson (2006)
No one stop shop facility	Kapurubandara and Lawson (2006)
Unstable e-commerce climate in the country	Kapurubandara and Lawson (2006)
Change in regulations with each government	Kapurubandara and Lawson (2006)

(Source: Chitura et al., 2008)

2.6.3 CSFs in EC

The above discussed research studies identify the necessary groundwork to set up an EC model, but they do not ensure the success of EC models due to the dynamic nature of B2C EC (Elliot, 2002). Research in CSFs about EC is in its infancy (Huang, Zhao, & Li, 2007). Rockart (1979, p. 85) is a pioneer, and defined CSFs as "the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation".

On the other hand, research studies about CSFs have met with some debate. Firstly, a methodological approach is difficult to apply because it focuses on the successful organisations, thus leaving out other organisations. Secondly, the simplification of generating results poses a serious problem, as some successful individual organisations are not representative of the whole population (Boynton & Zmud, 1984). The other criticism is the validity of the results obtained due to the dynamic nature of the market (Chamberlain, 1968). For instance, when a factor is found to be important, it will be rapidly adopted by many enterprises, thus it is no longer identified as a key factor guaranteeing the success of the enterprises. Nevertheless, research on CSFs is still identified to be critical in the IS research (Liu & Arnett, 2000; Poon & Lau, 2006; Teo & Ang, 1999; Wilson et al., 2008).

As mentioned above, the existing literature about CSFs is at an early stage, as most of the studies has been conducted in developed countries. More than that, there is a lack of reviews of CSFs in the existing literature. Therefore, the need for a meta-analysis of CSFs in order to understand the relevance of these factors is useful for filling the identified gap.

From the research goals of this study, it is believed that a comprehensive analysis of these studies in the meta-analysis will provide valuable guidance for formulating the research hypotheses and the development of a conceptual framework. However, it is acknowledged that the factors identified in developed countries may not necessarily be the same as in transition economies.

2.7 Review of Previous Studies about Applications Related to EC Adoption in Vietnam

2.7.1 Studies at the Individual Level

There is little knowledge about the development of EC in Vietnam, as only very few studies have started to apply theories and models to investigate customers' adoption of EC. Wang and Pho (2009) used the Delone and McLean information system success model (De&Mc model) and found that system quality, service quality, information quality and complementary relationships have an impact on brand credibility. This model posits brand credibility with two dimensions, namely, trustworthiness and expertise. The authors hypothesised that the factors from the De&Mc model have a positive impact on brand credibility. This construct, in turn, influences customers' satisfaction and intention to use online banking. More than 160 customers in the financial industry participated in the survey. The results showed that all hypotheses were supported except system quality versus trustworthiness and information quality versus expertise. The authors attributed the

exceptions to the low quality and the speed of Internet connection in Vietnam as people did not expect system quality and service quality to be related to trustworthiness and expertise (Wang & Pho, 2009) .

In 2010, Chong and his colleges employed the TAM and integrated it with the factors trust and government support to explore customers' intention to adopt online banking (Chong et al., 2010). The authors conducted a survey of 156 Vietnamese bank customers in Hanoi and Ho Chi Minh cities. All of the constructs included in the model influenced Internet banking, but perceived ease-of-use had a small impact on users' decision, which was attributed to the age of the participants (from 21 to 30 years old) and their ability to learn and use the Internet application easily (Chong et al., 2010). Similarly, others scholars have used integrated models to examine factors that have an impact on e-payment by applying the extended TAM, TPB, or e-CAM, and identified personal innovativeness in IT, subjective norm, perceived behaviour control and computer anxiety (Thieu, 2010), personal innovation in technology, and perceived risk (Lin & Nguyen, 2011) constructs to be significant.

Moreover, a study about EC customers in a Vietnam textile company based on Keeney's model (1999) found some variables to be significant in influencing the decision by the customers whether or not to buy products from the company: availability of information on the Website, accuracy of the information on the Website, the seller ensuring the products' quality, the seller's trustworthiness, and the safety of using the products. However, the limitations of this study are that the company where the study was conducted has a good reputation in Vietnam, and participants were young (from 17 to 30 years old). Therefore, participants' concern about risk may be low in this context, and their worry was more about how accurately the information presented on the company's Website in comparison to the products received (Vu, Phan, & Truong, 2011).

2.7.2 Studies at the Organisational Level

Investment in e-business depends heavily on a company *leader's vision*, as many online businesses aim to be pioneers. However, without a proper business plan and risk analyses, they could end up creating business processes and Websites that are ill prepared to make significant profits (The State Bank of Vietnam, 2009).

In the literature, there have been studies to explain EC adoption, that have used some models from developed countries. The samples range from organisations in service industries, like hotels, to art organisations. These studies apply theories, models and

constructs from the literature into integrated models. For example, there are some studies using TAM or TAM2 to analyse the relationship of Internet benefits, as well as intention to adopt EC and business activities in an enterprise (Hoang & Swierczek, 2008; Nguyen, 2007; Nguyen & Barrett, 2006). Others have used the TOE framework and DOI Theory to investigate macro factors that impact on the decision to adopt or not to adopt EC in Vietnam SMEs (Huy & Filiatrault, 2006; Huynh et al., 2012). However, these questionnaires asked what should be done from the participants' perspectives about improving e-commerce activities within the participants' enterprises, thus these statements in the questionnaire related to an idea about good e-commerce activities rather than actual practises in their enterprises.

In addition, these studies focused on the characteristics of users that lead to a decision to use IS systems. There has been no study to investigate how individuals and organisations relate to the extent of IS use and overcome barriers at each level of development due to the underdeveloped infrastructure and business habits in a frontier economy like Vietnam. Moreover, CSFs needed to be recognised and emphasised appropriately to achieve benefits from IS. For example, cash-on-delivery (COD) is a way to overcome risk when using e-payment in the context of Vietnam. It is also argued that good relationships between the customers and third parties can increase trust and decrease the risk of buying on the Internet. Last but not least, the actual process of adoption of EC in SMEs has not been investigated in the Vietnamese context, and therefore it is essential to identify the key factors that have an impact in order to ensure benefits for their EC business.

2.8 Summary

This chapter has provided a comprehensive discussion of various theoretical models that are relevant for investigating the EC adoption and implementation phenomena. The chapter showed the functionality and applicability of these theoretical models in ICT adoption research. The advantages and weaknesses of these theoretical frameworks have also been presented by highlighting the existing gaps in the literature. The integration of the TOE framework and DOI theoretical models has been identified as the most effective model for explaining the most relevant factors that may have an impact on EC adoption and implementation in the Vietnamese SME context. Additionally, to improve the measurement of adoption in a stage model, it has been identified that clarifying information about CSFs in B2C EC activities and providing more empirical evidences about EC adoption and

implementation practices in developing countries are necessary. Finally, some studies about EC adoption in Vietnam have been reviewed. There is a lack of adequate research about both the process of EC adoption and key factors that potentially benefit EC-based activities in Vietnamese SMEs.

As discussed in this chapter, there is a need to provide more empirical evidence regarding the adoption, practices, implementation and barriers to EC in developing countries, particularly in the context of Vietnam. In the next chapter, the research context will be discussed in more detail. The characteristics of Vietnamese SMEs, the general business environment, and EC status in Vietnam will be presented.

Chapter 3: EC Practices and SMEs in Vietnam

3.1 Introduction

The aim of this chapter is to introduce the research context of the study. The chapter will first briefly provide information on EC practices in SMEs throughout the world and in Vietnam. Firstly, the role of SMEs and SME position in the global economy alongside the inhibitors and enablers of EC adoption are also discussed. Secondly, the business performance of Vietnamese SMEs will be introduced in conjunction with the key characteristics of Vietnamese SMEs, and the prevailing EC environment will be presented. Finally, descriptive information related to the status of EC in Vietnam, such as the existing ICT infrastructure, customer usage, barriers and legal frameworks to EC adoption, will be discussed in detail.

3.2 EC Adoption

As stated in Chapter 1 and Chapter 2, EC has the potential to bring great benefits to the whole society. Around the world, however, various characteristics of local regions, such as IT infrastructure, government policies, and the local culture and economy have resulted in different degrees of EC adoption and EC development (Efendioglu & Yip, 2004). According to a 2010 Information Economy report of UNCTAD, the number of Internet users in developed countries is much greater than the number of users in developing countries (Figure 3.1), and this trend is estimated to continue (WTO, 2013).

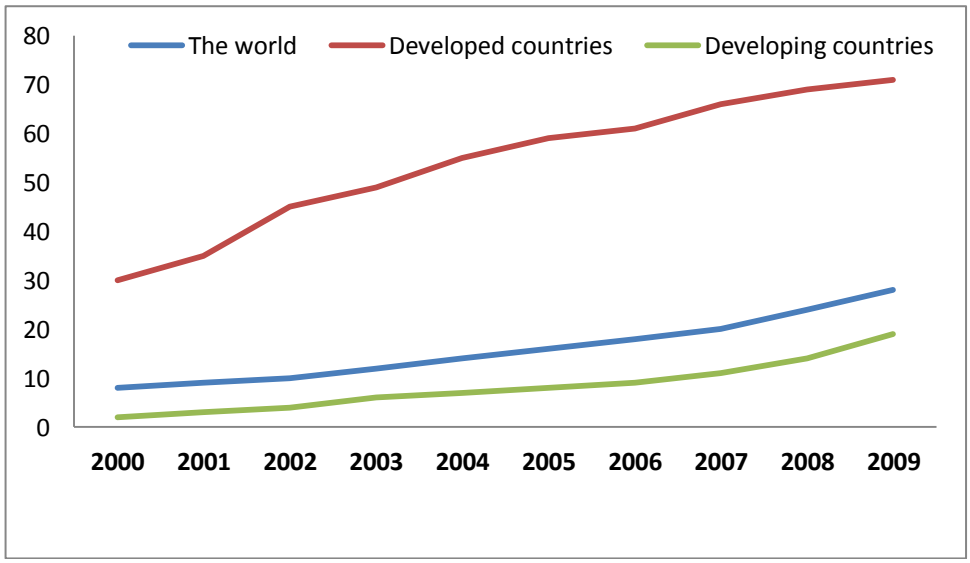


Figure 3.1: Internet users per 100 inhabitants, by country group (2000—2009)
(Source: UNCTAD, 2010)

Frontier countries are a subset of emerging markets (Berger et al., 2011), which are characterised by their relatively smaller size and the developing nature of the market economy. There are various providers that assess country markets, such as the FTSE group, Russell Investments, MSCI (Morgan Stanley Capital International), and Standard & Poor's. These providers all have different criteria. The table below shows the classification of country markets in 2015 as provided by the FTSE group (Table 3.1). The criteria are assessments based on the situation of the markets and the regulatory environment, custody and settlement, dealing landscape, and derivatives. In this present study, Vietnam is used as a representative research context for the frontier countries. The next sections will present the role of SMEs and the advantages of EC adoption for these enterprises.

Table 3.1: Classification of countries by their markets

Developed	Advanced Emerging	Secondary Emerging	Frontier
Australia	Brazil	Chile	Bahrain
Austria	Czech Republic	China	Bangladesh
Belgium	Hungary	Colombia	Botswana
Canada	Malaysia	Egypt	Sri Lanka
Denmark	Mexico	India	Tunisia
France	Poland	Philippines	Vietnam

3.3 Roles of SMEs in the Economy and ICT Adoption

3.3.1 Roles of SMEs

From a practical point of view, it is noticeable that the SME sector plays a critical role in both developing and developed economies. The SMEs supply a majority of businesses and offer employment opportunities for the workforce in both manufacturing and service industries. They also significantly contribute to national Gross Domestic Product (GDP) and to the overall economy in many countries (WTO, 2013). For example, SMEs contribute 55% of the GDP and over 65% of total employment in high-income countries, whereas in the middle-income countries, the contribution is 70% of GDP and 95% of employment. In the low income countries, the overall contribution is 60% of GDP and 70% of employment (Kongolo, 2010).

While the SME sector offers many advantages to the economy, lack of agreement and persistent variability in the definition of SMEs in the existing literature poses serious problems. In the existing academic research, researchers use many criteria based on

qualitative and quantitative measures to identify SMEs. Meredith (1994) noted that any definition of SMEs should comprise quantitative considerations such as staff levels, and turnover assets, alongside financial and non-financial evaluations. This definition of SMEs, however, has to include qualitative measures that describe the nature of the organisations and the various operations carried out by the company (Kartiwi & MacGregor, 2010). In practice, SMEs are determined differently by various governments and organisations. For example, the Australian Government defines a small business as one that employs up to 99 people, a medium business as one with 100 to 199 employees, and a large business as one that consists of more than 200 employees (ABS, 2001). On the other hand, the United States of America (USA) defines SMEs based on their position in the whole marketplace and the relative finance that they have in certain sectors, such as the manufacturing and mining industries (less than 500 employees) and non-manufacturing industries (average annual receipts less than $7.5 million USD)(SBS, 2014) .

Although SMEs can be defined in various ways, SMEs are identified to possess certain unique characteristics that set them apart from their larger counterparts. SMEs tend to take more risk than the large enterprises (Brigham & Smith, 1967; DeLone, 1988; Walker, 1975), which may account for the high failure rates among SMEs. In addition, SMEs have a short-term management perspective, thus reflecting their small management teams, consisting of one or two individuals, compared to the large management teams of their large counterparts (Bunker & MacGregor, 2000). Moreover, SMEs offer a small range of products/services to customers (Reynolds, Savage, Williams, & Savage, 2000), which causes certain limitations in creating added value to their customers, and puts them in a low competitive position (Gilmore, Carson, ODonnell, & Cummins, 1999). Welsh and White (1981) state that SMEs are usually deficient in resources and lack appropriate information on the use of information systems, therefore, the nature of the environment where they usually conduct their business will dictate how effectively they can embrace information systems in their existing business activities. As a result, SMEs tend to face many major barriers to adopting EC and competing in the global environment.

3.3.2 EC Adoption of SMEs

The low EC development of SMEs compared to larger enterprises is widely evident. This can be seen in some reports on ICT adoption in the Asia Pacific and European regions (European Commission, 2004; UNDP, 2007). According to UNCTAD (2010), although ICT adoption in SMEs is lagging behind large enterprises, it is estimated that SMEs

achieve more benefits than other sectors, particularly in developing countries (WTO, 2013). EC adoption enables SMEs to earn better profit margins and cost savings, as conducting business by EC may not need cost associated physical infrastructure. Moreover, SMEs can provide better and faster customer service by employing EC (Looi, 2005; Tse & Soufani, 2003) due to their small-scale operations.

At the macro level, contextual differences have various impacts on the extent of EC development as well as the speed of EC diffusion. In 2005, Zhu and Kraemer studied EC adoption in the retail industry sector and compared developing and developed countries. Their findings showed that various factors have influenced EC usage and benefits, with one variable, international scope, playing a contradictory role in EC adoption between developing and developed countries. Similarly, according to the UNCTAD (2003) report, EC diffusion in developing countries is lagging behind than the expected rate. As a result, many researchers have tried to explain this variation by determining critical facilitators and/or inhibitors in developing countries and have linked the research investigation to various physical, technological, institutional, and socio-economical obstacles (Davis, 1999; Enns & Huff, 1999; Jennex & Amoroso, 2002; Mukti, 2000; Travica, 2002).

Understanding the adoption level of EC in SMEs has been the focus of recent studies. The main consideration is to explore the barriers that prevent SMEs from adopting EC activities. Initial evidence indicates that there are obstacles due to the unique characteristics of the SMEs and the environment in which they operate. The variations are more prevalent as SMEs operate in unique contexts with different EC maturity levels. Thus, different contextual environments leads to varied levels of EC development, as has been shown in the existing research studies (Gibbs et al., 2003; Kartiwi & MacGregor, 2007, 2010; Zhu & Kraemer, 2005). In addition, the studies have shown that EC growth also depends on the unique characteristics of SMEs (Cloete et al., 2002; Wilson et al., 2008). Therefore, in regard to EC adoption by SMEs in frontier countries, it is logical to assume that the characteristics of SMEs and the nature of the business environment affect the diffusion of EC.

Frontier countries form a significant proportion of the developing world, and their economies are less integrated into the global economy (FTSE, 2015). To the best of our knowledge, there exists very little information about EC usage and the extent of EC adoption by SMEs in these countries. In order to understand this problem the researcher intends to investigate EC adoption in SMEs in Vietnam, which is a frontier country that forms the research basis for this study.

3.4 Vietnamese SMEs Sector

After 1975, when North and South Vietnam were reunified, the economy was controlled and planned centrally by the government. State-Owned Enterprises (SOEs) played a prime role in boosting the country's economy. However, during the Sixth Congress of the Vietnamese Communist Party in 1986, the economy was restructured though a process known as ''Doi moi'' (meaning Renewal). This new policy allowed many types of ownership structures to be accepted in the Vietnamese economic system, including collective ownership, joint-stock ownership, private ownership and foreign investment (Le & Truong, 2005).

The new policy has brought a new structure to the economy in terms of ownership status. According to a 2012 report from Vietnam's General Statistics Office (GSO, 2012), the number of SOEs (3.230 enterprises) accounted for 1% of the total Vietnamese enterprises, which was a decrease by 12.7% compared to 2006, while the non-state-ownership enterprises grew up as 2.56 times over the number in 2006. The figure for the Foreign Direct Investment (FDI) (8.800 enterprises) sector doubled from 2006 to 2012.

3.4.1 SMEs in Vietnam

After the reform process, the Vietnamese economy has experienced a rapid development of SMEs, which has played a crucial role in stimulating the market environment (Hansen, Rand, & Tarp, 2009). SMEs were defined by the policy makers as companies with no more than 200 employees and five billion Vietnam Dong (VND) in capital (Dispatch no.681/CP-KTN issued on 20/6/1998). The aim of the enactment of the *Enterprise Law* in 1999, was to create a level playing field for all ownership sectors, and to ensure the rights and benefits of investors. One of the best advantages of the new law is that the registration process for business has been simplified significantly. For example, the Enterprise Law removed over one hundred business licence requirements and decreased expenses and the amount of time needed to register a business. As a result, there was a dramatic increase in the number of registered SMEs in the following years. According to a 2013 document of the GSO in Vietnam (Pham, 2013), in 2011, there were 304,903 SMEs in the Vietnamese economy, accounting for 97.5% of the enterprises in the economy, in which the percentage of non-state-owned enterprises is 97.1%. Consequently, the term 'private sector' is often used as a synonym for SMEs in the Vietnamese context. The number of SMEs in 2011 was 8.5 times more than in 2000.

The development of SMEs and the impact created by the Enterprise Law in Vietnam is questionable. For example, the strategic identification of which the SMEs are in the actual operation, which went bankrupt, or which did not even start their businesses is deemed to be cumbersome in reality (Hakkala & Kokko, 2007). Moreover, many SMEs operate informally, such as those owned by the farmers and identified as household enterprises with a strong entrepreneurial culture, and which make up a significant proportion of the Vietnamese SMEs that have never been accounted for accurately (World Bank, 2006b). Furthermore, a majority of the SMEs register just to get hold of invoice books for the Value Added Tax (VAT), as these books help them to sell goods and services to the government and SOEs. In a report released by the World Bank (2006b), only 45% of registered enterprises during the period 2000 to 2004 actually existed in 2000 in the form of a household business. Yet, in another survey in 2001 from the Vietnam Chamber of Commerce and Industry (VCCI, 2001, as cited in World Bank, 2006b), 70% of registered enterprises were identified to be truly new. The remaining enterprises are identified to be a result of some sort of 'upgrade' from a household business, or registered by the owners who have been working informally in the same industry for years (who are not registered to the authorities). In conclusion, the increase in the number of SMEs does not necessarily imply the development of new firms, as SMEs are prepared to enter into formal activities as associated economic activities change dramatically.

The latest decree of the Vietnamese Government identified SMEs as having less than 300 employees and 20 billion VNDs in capital (Decree no 56/2009/NĐ-CP issued on 30/06/2009). The decree aims to determine and support SMEs in terms of finance, real estate, technology, development, and market expansion, thus improving manpower, and offering opportunities to provide products and services to the government. This policy is in progress now and there exists very limited information about this process. However, according to Mr Dao Van Ha, the Director of the Financial Committee of ODA funds (Official Development Assistance Funds), 90% of SMEs are not able to access the available financial incentives (Enterprise Forum Magazine, 2013). Based on this definition, the distribution of SMEs in the Vietnamese economy is showed in Figure 3.2. The pie chart presented on the left side shows the actual proportion of SMEs in the economy, whereas the pie chart on the right reveals the percentage of enterprises in the Vietnamese economy classified as micro, small, or medium sized.

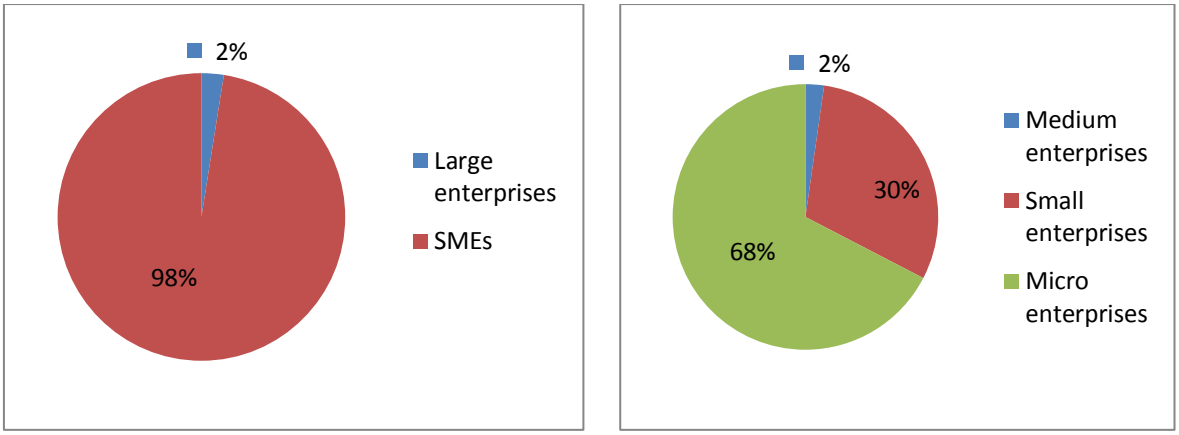


Figure 3.2: Distribution of SMEs in the economy

(Source: Data from GSO, 2011, as cited in Pham, 2013).

Vietnamese SMEs have been creating a pool of jobs and delivering a boost to the national economy. The estimated contribution of SMEs to Gross Domestic Product (GDP) in Vietnam is about 40% to 50% (VCCI, 2013). In addition, 90% of the labour market was recruited by SMEs in the period from 2000 to 2005 (Huynh et al., 2012). SMEs' contribution has been much more successful than the state enterprises alone in generating new employment in the past decade (World Bank, 2006a). SMEs has alleviated poverty in the countryside and narrowed the development gaps amongst the regions. SMEs also played a very important role in maintaining the high flexibility of the workforce and absorbing the 'shocks' as a result of the transition process from a centrally planned economy to a market-oriented process. This process is deemed to be very important in the Vietnamese context, as the transition process was identified to be critical in the collapse of the socialist bloc in Eastern Europe (Le, 1997, as cited in Tran, Le, & Nguyen, 2008).

SMEs have also gradually made their business capabilities visible to the authorities. The majority of SMEs are in domestic private sector, and they still suffer from unequal treatment in the business environment (Hakkala & Kokko, 2007). For example, SMEs have to operate under a separate law to the competing SOEs, who still dominate the economy and have many advantages, such as access to resources. Despite the existence of policies to support the development of SMEs, there is no policy specification that actually supports the growth of an enterprise from small to medium sized to large. The owners of SMEs are not sure to what extent they should make decisions regarding the size, capital investment, and the scale of business development (Boisot, 1997; Kokko & Sjöholm, 1997; Le & Rondinelli, 1993; Nguyen, Weinstein, & Meyer, 2005). The large enterprises in Vietnam

are expected to fit within the state-owned enterprises category. It is argued that a unified law is needed to create a level playing field for all business types, irrespective of their size. Nevertheless, it is not enough for the long-term development of SMEs, as SOEs still have privileges from the government authorities and are identified to be the most significant barriers to the development of larger SMEs.

3.4.2 SME Practices

This section will provide some characteristics of the business environment and SME practices, including the ownership of SMEs, market opportunities, resource allocation priorities, socio-cultural operating environment, and the associated legal framework and administrative reforms. The business practices that SMEs get involved in on a regular basis may impact on the SME decision to adopt and implement EC in Vietnam.

3.4.2.1 Business environment

A high degree of informality and unevenness in the SMEs' business environment are identified to be common in Vietnam (Tenev, Carlier, Chaudry, & Nguyen, 2003; World Bank, 2006b). Informality in SMEs refers to the many economic activities that are not defined or binding in the existing rules. The prevailing informal nature of SMEs has resulted in a mismatch between institutional rules and the business environment, in which there are many unregulated laws, as the official laws are not executed in an effective manner (Tenev et al., 2003). As a result, the outcomes of economic reform are unpredictable in a business environment with a high degree of informality in the SME context. This situation creates unevenness for start-up SMEs and often make it difficult for them to compete with the established SMEs, SOEs and Foreign Direct Investment Enterprises (FDIEs). For instance, SOEs with extensive experience, a close relationship with the authorities and a strong financial capacity have clear advantages when participating in public procurements or investing in projects or products and services from government over SMEs that are not able to pay bribes. Payment of bribes is not rare in Vietnam, due to the high degree of informality. As can be seen in Figure 3.3, it is evident that in 2011, bribes were largely used by the owners of SMEs to manage taxes and tax collectors (30%), and to coordinate the public services (26%). Smaller monetary percentages were paid to get licences and permits (8%), to gain government contracts/public procurement (6%), to deal with customs (4%), and other purposes (26%) (Rand & Tarp, 2012).

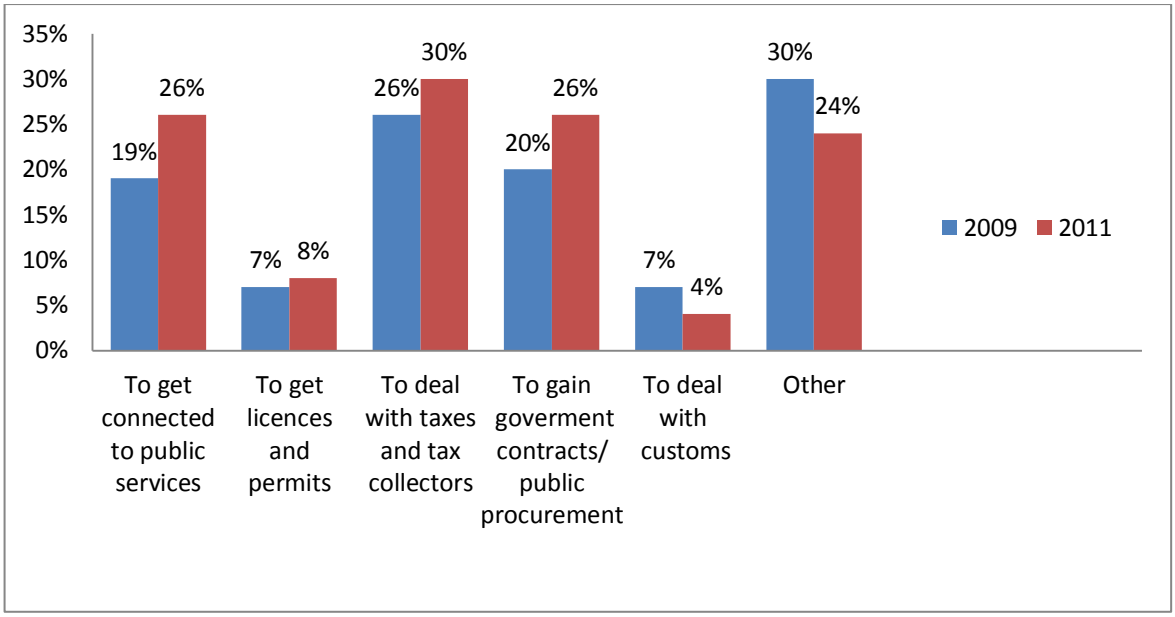


Figure 3.3: Purposes for paying bribes
(Source: Rand & Tarp, 2012)

3.4.2.2 SME owners

Vietnam notably has an entrepreneurial culture where every household carries out some sort of business activity (World Bank, 2006b). SME owners are identified to be high risk-taking (Swierczek & Ha, 2003) and hardworking individuals and willing to take challenges (Ronnås & Ramamurthy, 2001). However, in this extremely competitive business environment, SME owners often tend to focus on short-term profit generation rather than long-term business growth (Masurel & Smit, 2000; Thai & Swierczek, 2003). Moreover, Vietnamese SME owners are identified to be weak in their management capacity compared to their counterparts in ASEAN countries (Hsieh et al., 2004).

On other hand, SME owners have weak cluster and networking. Clusters of SMEs and their networks are believed to provide an advantage for dealing with the lack of resources in SMEs, and create a greater demand for the building of supporting infrastructure (Nguyen, Alam, & Prajogo, 2008a). These relationships evidently help SMEs to improve their performance and productivity (Terziovski, 2003). Although the business relationships play a critical role in SMEs' business activities, these relations hips, particularly in the Vietnamese SME context, are observed to be deficient and weak (Nguyen, Alam, Perry, & Prajogo, 2009; Tran et al., 2008). Weak business relationships and networks present difficulties to SMEs, particularly in making connections and building networks with other SMEs, academic and research institutions, universities, supporting

organisations, and large enterprises. Nguyen et al. (2009) highlight the fact that SMEs still think that they are self-reliant enterprises and therefore lack the necessary skills to form any clusters, links, or networks to enhance their overall business performance.

In addition, nearly all clusters are located in rural areas in the form of handicrafts and industrial or trade villages. A majority of these business networks are informal, as the nature of informality helps SMEs to conduct business in an easier manner. For example, social networks facilitate the process of obtaining business licence permits, accessing government contracts, obtaining preferred credit, accessing low tax options, and receiving informal payments (Tran et al., 2008). Despite these benefits, Vietnamese SMEs lack appropriate skills and competencies to form business clusters and networks.

The reasons for these type of unique situations that are prevalent within the SMEs can be explained by the specific nature of the entrepreneurial culture, undeveloped market institutions, variations in the court procedures, regulation bodies, and certification agents in Vietnam. Bryant and Nguyen (2004) noted that poor transaction supervision resulted in a lack of trust amongst SMEs, which is a major deterrent to developing clusters and networks (McMillan & Woodruff, 1999; Nguyen et al., 2005; Nguyen, 2005; Nguyen, Le, & Freeman, 2006). Consequently, SME owners depend heavily on their own personal knowledge and family ties in order to ensure safe and reliable transactions with their day-to-day business activities (Harvie, 2001).

3.4.2.3 SMEs market opportunities

SMEs sell most products and services on the domestic market. Vietnamese SMEs have very few chances and abilities to reach and compete in the foreign market, due to the unique characteristics of the SMEs and the nature of their business environment.

The available statistics show that 60% of SMEs provide their main products to both the domestic market and to non-state-owned enterprises that act as intermediaries, and 31% to local people. On the other hand, only 4% of products are sold to SOEs and 1.5% are sold to FDIEs (Rand & Tarp, 2010). However, the domestic market estimated is relatively small. Additionally, the existing competitive environment poses serious constraints to SMEs' development (Hakkala & Kokko, 2007). An attractive option for SMEs' success in the prevailing situation is to get direct contracts from the state. However, SMEs are unable to pursue the aforementioned option due to the existing public bidding process, which is arguably heavily biased towards the benefit of SOEs over SMEs (World Bank, 2002). For example, the most common requirements for the process of bidding include relevant

bidding documents, broader experience of the participants, access to many services through one contract, a relatively short time associated with the submission process, obligations to share detailed and sensitive information that is not related to the procedures, permits associated with government and sub-enterprises of SOEs, and frequent changes with the bids as needs arise (Martin, 1999). Furthermore, with a high degree of informality, paying kickbacks, that are relative to the value of the transaction when dealing with procurement or construction is deemed to be a common practice (Vu & Haughton, 2004). In addition, products from SMEs are generally perceived to lack the quality to sell to FDIEs. These constraints contribute to an unfair competitive environment for SMEs in comparison to their SOE counterparts in Vietnam.

Ideally, the export market could be an avenue of promising revenue because of the small size of the domestic market, but it is not readily available to SMEs. As the fixed export cost is high, SMEs struggle with issues of affordability. The available statistics show that only 2.4 % of SMEs sell goods on the international market (Rand & Tarp, 2010). The majority of the SMEs have not been involved in any sort of preparation in order to seize the potential advantages associated with the export market as Vietnam integrates with the global economy (Hakkala & Kokko, 2007). A vast amount of information is obtained by SMEs through informal internal resources, such as personal contacts within the company or the media. Limited information about the market, opportunities, strategic plans, and trade policies that is available to the SMEs has been identified as a major impediment to their export opportunities, and often create mistrust amongst the partners (Nguyen et al., 2009). Thus very few firms have the ability to compete in foreign export markets (Hakkala & Kokko, 2007).

3.4.2.4 SME resource allocation

Finance

Lack of resources in Vietnamese SMEs is attributed to tough competitive environments and the nature of SMEs. Additionally, the reasons for not being able to access capital resources vary amongst Vietnamese SMEs, and depend upon banks' willingness to lend funds to SMEs, their ability to assess business prosperity, their policies, and the personal motivations of SME owner-managers.

SMEs depend heavily on informal credit options such as their own retained earnings, family earnings, and informal lenders (Bryant & Nguyen, 2004; Nguyen et al., 2009; Nguyen et al., 2008a). Tenev et al. (2003) showed that 70% of the total finance of

SMEs is from retained earnings, 15% is from the commercial banks and the remainder comes from other informal credit options. These figures provide proof of the unequal distribution of finance for SMEs. According to a report from GSO (2004), more than 50% of the credit is kept for SOEs, despite the low level of credit availability options. In particular, there is a low percentage of loans being given to SMEs: non-stated-owned banks provide only 15% of their lending to SMEs and State-Owned Commercial Banks (SOCBs) provide 49% (Long & Nguyen, 2007, as cited in Tambunan, 2011). Not only do SMEs have limited access to short and long term credit options in the form of domestic formal capital funds, but they also have no access to foreign funds (Nguyen et al., 2009).

SOCBs are not willing to provide SMEs with credit due to the advantages that SOEs possess over SMEs and the strong inclination of SOCBs towards SOEs. SOCBs have a lending policy that provides credit to SOEs, thus limiting the funds available for SMEs. Another explanation is the long established relationship between SOCBs and SOEs. The existing bank documents illustrate that the four largest SOCBs extended their credit by up to 45% for SOEs, whereas other banks have made only 14% of available funds accessible to SOEs (Hakkala & Kokko, 2007).

The underdeveloped legal framework has been partly responsible for the careful lending practices that require other types of collateral options. According to the US-based Milken Institute, the legal framework is critical for the Vietnam's finance system, and this framework includes contract enforcing, property entitlements, corruption reduction, collateral expenses, insolvency procedures, efficiency of the legal framework, and the responsibility of local government regulation, which is obviously weak in these identified areas (Hakkala & Kokko, 2007). The bank officers minimal knowledge or ability to assess and manage the secured collaterals, like machinery, are claimed to be a barrier to SMEs obtaining a loan. Hence, focus has shifted more towards collateral options than business prosperity, even though these options do not offer a guarantee to the lenders and their prospective customers (Malesky & Taussig, 2009).

In addition, one of the criteria for lending loan documents is the presentation of Certificates of Land-User Rights (CLURs). The possession of CLURs is not an option for SMEs due to the prevailing common practices associated with the ownership of industrial land by SOEs (Carlier & Tran, 2004). As a result, SME accessibility to credit options is minimal in Vietnam.

Problems associated with financial and credit policies are identified to be the major inhibitors of the development of SMEs. These problems relate to the prevalence of

corruption, favouritism towards SOEs, stringent application processes, an irrational credit policy, insufficient concern about the rights of using land, unclear responsibilities of supporting bodies in assisting SMEs to overcome financial constraints, the lack of government scrutiny, and the lack of indemnity funds (Hakkala & Kokko, 2007).

SME owners do not usually take up bank loans. SME owner-managers also claim that it is difficult to deal with banking procedures due to unfair treatment by the banks such as high interest rates to SMEs (Long & Nguyen, 2007, as cited in Tambunan, 2011). Malesky and Taussig (2009) demonstrated that 'the possession of CLURs' and 'connectedness' (in which owners of SMEs have had a previous occupation in the state) have great influences on the ease to obtain a loan. All of these problems create a very difficult environment for SMEs in Vietnam to attract skilled manpower and other required resources, like credit and land (Nguyen et al., 2008a).

Technologies, innovation and human resources

SMEs have commonly been seen as having inappropriate technologies and inadequate human resources as a result of a range of shortcomings and long discrimination against the private sector. They have also had limited access to capital, credit, and land, low technology market development, and an ineffective education system.

Technological development in Vietnam is still in its infancy. According to Tran et al. (2008), in reference to the three stages of technological development, namely adoption, mastery and creation of technologies, Vietnam is still in the first stage of development. Funds invested in research and development are very low, with only 0.25% being spent from the income of SOEs, while SMEs do not spend on this activity (Tran et al., 2008). Furthermore, the technological market is underdeveloped due to lack of commercialisation of technology-related products. This situation results in the creation of weak links between research institutions, including universities, research centres and enterprises. Consequently, the technological market cannot meet the demands of SME development and SMEs' particular technology the requirements.

There is no current policy and real technological support directed towards SMEs in Vietnam. The support provided by the state through research organisations and technology support services is meant for SOEs rather than SMEs. Coupled with the weakness of the existing legal framework related to technology, this poses another problem for SME development, with issues relating to property rights, patents and trademarks, technology transfer, and importation of used equipment (Nguyen et al., 2009).

Human resources in the SMEs are also important for SME development. The lack of skilled human resources is attributed to the existing education system in Vietnam. Educational and vocational training systems are not effective and mainly focus on teaching theoretical principles rather than generating thrust in practical implications (Rand & Tarp, 2010). As a result, the existing human resources are unskilled and often the vocational training offered is not sufficient to develop the necessary skills. The available statistics show that 70 to 75% of manpower in domestic enterprises is unskilled (Tran et al., 2008). As SMEs have limited financial resources, they cannot afford to attract and retain skilled staff for long periods.

Last but not least, SMEs have to pay a high cost to access basic resources. The reason is attributed to the prevailing monopolistic nature of SOEs in crucial areas such as the Internet and telecommunication, utilities and transportation, electricity, oil, and coal sectors, creating unreasonable costs due to the high fee charged to access these resources. A study has shown that business spending in Vietnamese SMEs is significantly higher than that in other countries with similar economic development (Nguyen et al., 2009).

3.4.2.5 Socio-cultural environment

SMEs have long suffered long discrimination in the society due to the prevailing socio-cultural environment in Vietnam.

Negative opinions from the public about SMEs are common in the society (Nguyen et al., 2008a). The general public tend to judge SMEs in Vietnam as unstable and vulnerable to bankruptcy. As a result, SMEs are branded as treating their workers unfairly, having a dishonest nature, and being opportunistic (Webster, 1999). Even though the legal framework guarantees an equal competitive environment between the partnerships, there is still an ‘unwritten law’ of discrimination against SMEs existing in the society (Nguyen et al., 2009; Nguyen et al., 2008a).

The existence of strong uncertainty avoidance and distrust behaviours are widespread amongst SMEs. This can be explained by the fact that the entrepreneurial culture is inconsistent with the existing Vietnamese socio-cultural environment (Thai & Swierczek, 2003). These attitudes are also consistent with the weaknesses associated with a property-based legal system and the maintenance of a socialist ideology (Bryant & Nguyen, 2004).

3.4.2.6 Legal framework, administrative reforms, and incentive policies

The Vietnamese Government has been improving the legal framework, and undertaking administrative reforms, as well as creating incentive policies to support the development of SMEs. Initiatives taken by the government include providing support programs for SMEs to improve SME owners' skills, creating opportunities to build strong clusters of SMEs, promoting SME ability to reach foreign markets, and creating a fair business environment for SMEs and other business sectors. However, these initiatives take time to have an effect, and there are time constraints in implementation.

In a study on Vietnamese policies, Nguyen and Wongsurawat (2012) tested the efficiency of 13 supporting policies and infrastructure for performances of enterprises: tax deduction/reduction, tax exemption, loans, fiscal aid, roads, electricity, telecommunications, internet, land buying/renting, land procedures, environment regulations, environment protection assistance, and property rights. The findings indicate that only seven policies have had a positive impact on SME operations, namely property rights, roads, electricity, Internet, tax reduction/deductions, loans and telecommunications.

The Vietnamese Government has been following a 'market economy under socialist guidance', which creates the dilemma relating to places and processing time caused by lack of evident practices (as there is no previous success model to learn from). The Vietnamese authorities encourage the growth of the private sector apart from focusing on the leader role of SOEs (Nguyen et al., 2005). It is argued that the Vietnamese authorities have mainly paid attention to increasing the number of SMEs rather than improving SME operations and reinforcing of competitive abilities (Nguyen et al., 2008a).

The Vietnamese authorities have gradually started to realise the roles of SMEs, and have set up supporting organisations to promote the development of SMEs by providing information and training programs. However, it is evident that the available support regime has worked ineffectively due to the prevailing weakness of institutions and a lack of appropriate coordination between policy making, implementation and environment factors (Nguyen et al., 2008a). The capacity of support organisations to administer the proposed initiatives is greatly limited.

According to Nguyen et al. (2009) study, owners of SMEs claim that the quality of advise received from support program officers is poor, as the advise is too general, and often lacks incentive policies, legal regimes and feasibility in implementing the proposed training programs. SMEs experience a shortage of good technical advice and information, apart from receiving poor quality information. Furthermore, the lack of competence of

government officers is problematic for owners of SMEs and prevents them from developing scalability of operations. The neglect of SMEs by consulting firms is also identified as a contributing factor. As a result, SMEs are likely to search for guidance from unauthorised sources and depend heavily on hiring external advisors for sourcing appropriate market information. A gap between SME demands and available services in Vietnam is evident.

Being aware of the role of the clusters and networks, the Vietnamese authorities started to promote these relationships as stated in 2003 Vietnam Cluster Initiative (VNCT) project and building Vietnamese competitiveness:

> Efforts on building commercial collaboration among cluster members were limited. As a result, the foundation for trust and cooperation among cluster member were not significantly enhanced. The effectiveness of forming a broad partnership with key cluster champions, including association leaders, local governments, VCCI, universities and other donors is low. (VNCI-1, 2003, p. 2)

However, there is no specific strategy to link SMEs, and there are unclear policy guidelines to help SMEs co-operate with large businesses as providers, customers, or producers. Also, a clear policy direction has not been set up to create a mechanism in which supporting industries can transfer knowledge, infrastructure and resources for the benefit of each other (Nguyen, Alam, & Prajogo, 2008b). In addition, technical advice from supporting organisations has failed to meet the demands of SMEs as there seems to be a lack of collaboration amongst these organisations (Nguyen et al., 2009).

In order to strengthen the competitiveness of SMEs in the export market, the Vietnamese Government has been helping SMEs since the 1990s through support mechanisms such as the provision of information related to the markets, subsidies, export consultants, and by enhancing global business skills development via training, trade fairs and business infrastructure assistance (Hansen et al., 2009). The tariff motivation, nevertheless, is vague and is not targeted to the benefit of SMEs. There is a need to overcome many tariff obstacles, such as the tax rates imposed on used tools, as these processes are usually heavily reliant on customs officers' discretion and the availability of financial incentives to SOEs. Complicated bureaucratic procedures, like obtaining the import-export licences, lead to difficulties associated with the achieving of quotas (Nguyen et al., 2009).

In order to attain a level playing field, the government should remove the specific advantages available to SOEs by speeding up the equalisation process and strengthening the

existing legal frameworks. As discussed above, the process is likely to remain slow, so looking for other feasible measures is necessary to promote SME accessibility to markets and resources like land and capital. SMEs with several shortcomings will not be able to compete with SOEs and FDIEs in terms of technologies, skills, capital, and foreign products. Consequently, strengthening the competitive capacity of SMEs through market expansion and technological advancements is pivotal (Hakkala & Kokko, 2007). EC implementation may be a suitable solution for Vietnamese SMEs, as it will help them to easily search for market information, and advertisements, and allow for massive promotions that will open up new business opportunities (Harvie, 2001; World Bank, 2006b). Moreover, ‘‘the use of EC to compete more effectively with large players’’ has been referred to as ‘‘levelling the playing field’’ (Clayton 2000, as cited in Wilson et al., 2008, p. 494).

With the rapid development of the Internet and computer systems, this initiative offers immense opportunities for SMEs in Vietnam. SMEs have recently started to conduct Business to Business (B2B) and Business to Customer (B2C) EC transactions. However, they have faced difficulties in the business environment due to the presence of poor physical infrastructure and weak legal frameworks, as well as a large number of EC customers with low willingness to conduct online transactions (Huynh et al., 2012). It is argued that focus on B2C business would offer SMEs competitive advantages, because large enterprises implement a B2C model at a much slower pace due to the challenges of technological change and the general obstacles related to adopting a new business (Drew, 2003). Zhu, Kraemer, et al. (2006)’s study about the extent of the use of e-business in various countries shows that large companies are less likely to achieve a higher level of e-business development due to constraints related to finance and management capacities.

The following section will detail information about EC components that are necessary for conducting online businesses.

3.5 Electronic Commerce Status

3.5.1 Online Payments

From the user’s perspective, e-payment in Vietnam is at a very early stage due to the underdeveloped EC infrastructure (Chong et al., 2010; Huynh et al., 2012). Many Vietnamese customers do not have any experience using online payment methods. Moreover, Vietnam is in the process of IT infrastructure implementation and development. One of the Vietnamese government’s strategies is to shift focus from the traditional

agriculture-based economy to the service-oriented economy due to the higher profit and growth measures associated with the service offerings. However, Internet banking for currency exchange is rarely used in Vietnam because of the underdeveloped financial sector and insufficient technological advancement (Harvie, 2001; Huynh et al., 2012). Furthermore, critical issues of security and privacy are still difficult for online customers to understand, which has an impact on building trust in using online banking channels (Chong et al., 2010).

On the other hand, from the viewpoint of the industries, there are many barriers to the adoption and implementation of online banking in the Vietnamese financial sector. First, the low degree of *credit card usage* could be a factor. As mentioned before, there are many reasons for the Vietnamese to prefer using cash rather than credit cards, including trust, low IT infrastructure, fear of security, privacy (Hoang & Swierczek, 2008; Orbeta, 2005). Secondly, several weaknesses in the banking area can explain the low online transactions (Hoang & Swierczek, 2008). For instance, Vietnamese banks tried to set up an internal network amongst banks in order to support electronic transactions; however, the system did not work well and could not be used in practice due to incompatibility of the IT infrastructure. Moreover, there is no synchronisation in the processing system in the commercial banks, and the lack of a standard technical system to connect central offices and their affiliates has posed serious problems. The incompatibility of software applications used by banks inhibits the development of e-payment services (State Bank of Vietnam, 2006, as cited in Hoang & Swierczek, 2008). In short, although some banks are offering electronic banking services, they are still underdeveloped; Vietnamese customers lack confidence in the electronic payment system and do not use it widely (Wang & Pho, 2009). Banks service fees for using credit cards also inhibit their adoption in Vietnam (Le, 2013; VnExpress, 2015).

Moreover, customers are not keen on making payments by using credit cards as these cards are also perceived to be insecure and there is a fear of losing money. Based on the barriers discussed above, not very many companies conducting businesses in Vietnam seem to have enough motivation and security to provide electronic purchasing of services (Hoang & Swierczek, 2008).

3.5.2 Customer Usage

Vietnamese customers have the habit of buying goods in convenient places in stores located near their homes or on the way to work (Vu, 2012a). According to a Nielsen

Company report in 2012, approximately 24.4% of Vietnamese did their purchasing in wet markets, 10.9 % in traditional groceries and 3.2% in supermarkets (The Nielsen Company, 2012). Moreover, the data from the report show that the customers are loyal to the brands they purchase and rarely switch to other brands. This probably explains why most Vietnamese customers do not rely on information from media and marketing channels; instead, they make decisions about purchasing a product based on recommendations from their relatives and friends, which aligns with the traditional word-of-mouth marketing (the report showed that 92% of Vietnamese customers have this type of marketing behaviour). Many customers also buy certain products in stores due to the reputation of the sales personnel (Vu, 2012a).

Vietnamese customers pay for most goods and services by cash (Chong et al., 2010; Hoang & Swierczek, 2008; Orbeta, 2005), with 90% of retail transactions involving cash payments (Lin & Nguyen, 2011; Thieu, 2010). In addition, Vietnamese customers are also keen to check the quality of the goods or services and appreciate physical transactions. For example, in the tourism area, travel agencies routinely examine facilities first hand before introducing them to tourists. Tasting food, checking bedrooms in the hotel and initiating direct negotiations with the suppliers are very important in the Vietnamese hospitality industry (Hoang & Swierczek, 2008). Although service providers Websites are informative, they cannot supersede traditional face-to-face transactions. Moreover, the general usage of the Internet is very low in Vietnam (Hoang, 2003). The increase in Internet frauds and the shortage of detailed sanctions against the criminals may inhibit customers from using EC (Vu, 2012b). In a study conducted by Van Polen, Moura, and Pras (2011) about Internet frauds, Vietnam is one of the top 20 countries in the world with a large number of Internet hackers. According to an owner of two big EC Websites in Vietnam, namely, ***www.chodientu.com*** and ***www.nganluong.vn,*** customers only surf the Web to find information about products, but not to purchase products; there are only a few transactions in which the customers pay online, and where the owners of the Websites provide service warranties and guarantees. A report from Nottebohm et al. (2012) also confirms this statement. It has also been noted that successful EC requires a well-developed legal framework to support online transactions (PC World Magazine, 2010).

3.5.3 Internet Infrastructure

The Internet started to develop in Vietnam much later than other countries (Hoang, 2003; Lam, Boymal, & Martin, 2004), but the rate of Internet diffusion has been growing

rapidly. Vietnam set up Internet public access on 19 November 1997. From that time to 2012, the number of users increased dramatically; for example, the number of Internet users was 3.80 % in 2003, but increased almost tenfold to 35.58% towards the end of 2012 (VNNIC, 2012) (Figure 3.4). Similarly, total international connection bandwidth in Vietnam increased from 658.5 Mbps in 2003 to 1,400,000 Mbps in 2015 (VNNIC, 2012; VNTA, 2015). According to a report from the World Economic Forum (2011), Vietnam is in the top ten countries that have improved their ICT network significantly within the period from 2006 to 2010.

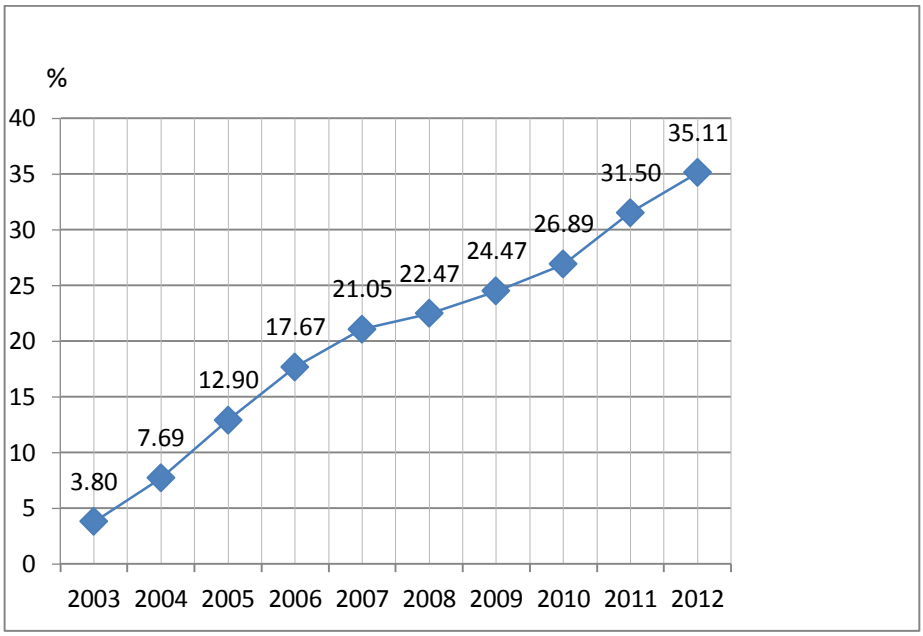


Figure 3.4: Internet users per capita
(Source: Vietnam Internet Network Information Centre (VNNIC), 2012)

According to a 2011 Vietnamese Government report, 100% of Vietnamese enterprises use PC, and 98% have an Internet connection, of which 78% connect to ADSL. Ninety-three percent of large enterprises and 73% of SMEs use e-mail in their business transactions. Moreover, 4% of the enterprises use Enterprise Resource Planning (ERP) systems, 15% use Customer Relationship Management (CRM), and 17% use Supply Chain Management (SCM). Furthermore, 30% of the businesses are identified to have a Website (VECITA, 2011). A 2011 survey of Vietnamese enterprises aimed to investigate the barriers to conducting business on the Internet. The enterprises were asked about the obstacles that they perceived hindered the adoption and implementation of EC in Vietnam. The barriers fell within the categories of weakness of the physical delivery system, weakness of the legal system, lack of skilled human resources in EC, underdeveloped e-

payment systems, insecurity in doing business based on the Internet, and low awareness about EC amongst population (VECITA, 2011) (Figure 3.5). The graph presented below shows that 'insecurity in doing business based on the Internet', 'low awareness about EC of the population', and 'underdeveloped e-payment systems' are high level barriers, followed by other barriers such as 'lack of human resources in EC', 'the weakness of the legal system' , and 'the weakness of the physical delivery system'.

Figure 3.5 : Perception of EC barriers
(Source: Researcher's own compilation)

DS: the weakness of the physical delivery system; LS: the weakness of the legal system; HR: lack of human resource in EC; PmS: underdeveloped e-payment systems; Aw: low awareness about EC of the population; S: insecurity in doing business based on the Internet.

3.5.4 Institutional and Government Framework

The legal systems play a crucial role in the acceptance of EC. As Gunasekaran and Ngai (2005) point out, enterprises and customers will not accept online transactions if there is not adequate legal protection.

The legal framework for EC includes the *Electronic Transactions Law* in 2005 and the *Information Technology Law* in 2006. The *Electronic Transactions Law* sets the basic legal foundation for electronic transactions (e-transactions) in society by recognising the legal validity of data messages and detailing the requirements of electronic signatures to ensure the reliability of message data when conducting transactions. If the *Electronic Transactions Law* just focuses on legal aspects of electronic trading, the *Information Technology Law* essentially provides the requirements of activities, the application of information technology development, and the measures to ensure policy and infrastructure

for these activities. After passing two main laws for EC, the authorities then enacted eight degrees to provide detailed regulations related to EC applications and activities, which include measures of EC management, e-transactions in the banking and finance sector, spam, electronic signatures and certificated e-signature providing services, Internet services and Internet service providers, IT applications in state organisations, providing information and public services on state organisations' Websites (VECITA, 2012) .

However, the legal systems in Vietnam with respect to conducting online businesses are weak, which presents a major obstacle to developing online payment systems (Hoang & Swierczek, 2008) and related activities. In Vietnamese business law, economic activities are heavily based on signatures and seals, and the Vietnamese Government still issues and controls many trade invoices (Hoang, 2003). In addition, the laws and regulations for online commerce, like intellectual property rights, electronic documents, and digital signatures have been introduced but lack specific sanctions and approvals (Hoang & Swierczek, 2008; Huynh et al., 2012). On the other side, the complicated Internet environment poses yet another problem for law enforcement. A simple illustration is that even if a crime is committed, it is difficult to collect, preserve, and evaluate evidence due to ease of modification of electronic data. Also, identification of victims is not easy, thus resulting in lack of a strong legal procedure (Law Magazine, 2013).

The use of unlicensed software is also high in Vietnam, as Yoo, Sanders, Rhee, and Choe (2012) report it to be around 86%. This causes disagreement between trading bodies such as business partners, finance, tax, customs, and security organisations. In addition, the Vietnamese Government restricts payment across countries and purchase of foreign currency (Orbeta, 2005).

3.5.5 EC Policies

Being aware of EC's vital role in boosting the economy, the Vietnamese Government has set up some supporting stages to develop EC in Vietnam as an overall plan for developing EC between 2006 and 2010. The overarching aim is to motivate at least 80% of SMEs to engage in B2B and B2C EC activities by the end of 2010 (Huynh et al., 2012). The authorities believe that the existing legal framework in Vietnam has been gradually improving, with the introduction of e-transactions law and information technology law creating trust amongst various stakeholders in Vietnamese small business networks (VECITA, 2012).

However, the effectiveness of these policies is questionable as the support offered by the government is unclear due to poor facilitating conditions as noted by Tran, Zhang, Sun, and Huang (2014). For instance, the authorities are interesting in boosting EC activities amongst small and medium-sized businesses in Vietnam. At the same time, the authorities are also keen to control the business activities of various enterprises, as they intend to manage and control the entire process. Moreover, there seems to be lack of sufficient knowledge and appropriate skills of the government offices due to the prevalence of ineffective legal systems, including tax, customer protection, e-payment, and intellectual property rights. SME need for technological innovation in Vietnam is perceived as low, and lack of resources for adopting EC is identified to be the most common deterrent (Huynh et al., 2012).

3.6 Summary

This chapter has presented information on the vital role played by SMEs in the national economy. The various advantages of implementing EC in the day-to-day business activities by SMEs have been acknowledged to improve the competitive abilities of SMEs. The level of EC development may vary due to the unique characteristics of SMEs and the specific context in which they conduct their business activities.

There is limited research that evaluates EC adoption and usage by businesses, particularly SMEs in frontier countries. With Vietnam as a research context, SME unique characteristics, including lack of land, finance, and human resources, coupled with weak management capacities, pose a serious constraint for SMEs to engage in any sort of EC. In addition, SMEs operate in a highly volatile and uncertain environment. Moreover, they have to conduct business in a highly turbulent environment, at times facing considerable discrimination from the society, despite making significant contributions to the national economy. Recently, SMEs have been recognised by the policy makers, who aim to accelerate their growth. Although the effective enforcement of these policies may take a long time, there appears to be an effective integration of the national and global economies occurring at a faster pace. As a result, the SMEs are facing greater challenges, outweighing the opportunities associated with the SMEs' business activities.

On the other hand, EC has been identified as a promising solution for the development of SMEs by providing adequate competitive advantages for SMEs. Information about common EC practices of SMEs, such as how SMEs adopt EC, how they overcome identified barriers, what activities SMEs need to focus on to enhance their

performance, and what CSFs are associated with the success of SMEs is limited and needs further investigation. Therefore, this research topic needs immediate attention due to its ability to add to academic knowledge by way of theory building, and to practice by effective policy formulation strategies.

In the next chapter, the research design and the hypotheses developed from the theoretical and practical perspectives are presented and discussed. The research paradigm, sample selection, data requirements and research techniques are also discussed.

Chapter 4: Analytical Framework, Hypotheses, and Data Structure

4.1 Introduction

In Chapter 2, the main theories relating to the diffusion of innovations within the context of B2C e-commerce were reviewed. An outline of the data requirements are also presented in this chapter. The proposed research framework aims to determine the extent of the relationships between identified variables of interest for SMEs operating in Vietnam, in particular those relating to the characteristics and measures of EC adoption, and those critical factors associated with the prediction of success in the use of B2C EC. Following the discussion of the application of EC in the context of Vietnam, this chapter presents the information related to the analytical framework that is employed in this research study through integration of various theoretical studies and existing empirical evidence. This chapter provides the guidelines associated with the selection of appropriate research methods and approaches that are used in order to answer the research questions stated in the earlier chapters.

The next section provides a brief overview of the research design and outlines the research hypotheses under consideration in this study. The research framework is presented in Section 4.3, Section 4.4 is devoted to a discussion of the data requirements, and a summary of the entire chapter is presented in Section 4.5.

4.2 Overview of the Methods of Analyses

Creswell (2009, p. 3) states that ‘‘research designs are plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis’’. The research design plan consists of three components: the worldview perspectives of the research, the inquiry strategies, and the methodologies for collecting, and analysing data and explaining the results.

Cooper and Schindler (2006) suggested that there are three important research designs that are commonly used in many disciplines: exploratory, descriptive, casual or inferential types of research. In terms of applying research designs to investigating IS adoption, scholars have used many methods and approaches at different times. Ebeling, Hoyer, and Bührig (2012) conducted a meta-analysis about research methodologies in IS implementation. The different research methods used in IS studies can be summarised as action research, conceptual/mathematical analysis, concept implementation/ proof of concept, case study, ethnography, descriptive/exploratory survey, field study, and literature

review, among others. The findings obtained from the extant studies also show that the most recent trend amongst IS researchers in terms of the implementation of research methods include the use of descriptive/exploratory survey, concept implementation, proof of concept, and a case study approach. Furthermore, a combination of many research designs is a common practice preferred by IS academic researchers.

In this study, the selection of research design is determined on the basis of the research goals and the outcomes of the current literature syntheses. This is consistent with the proposition by Creswell (2009) who indicated that the choice of research design is made on the basis of research objectives, the experience of the researcher, and the research carried out by the scholar community.

The primary aim of this research is to investigate barriers to B2C EC in Vietnamese SMEs using both primary data and secondary data. Therefore, the researcher used multi-stage research approach to meet the research objectives stated earlier in Chapter 1.

First, an exploratory study using qualitative research techniques was employed in this study. This approach was used because when the research context is ‘‘so new or so vague’’, the approach also helps to overcome ambiguous and controversial findings presented in the existing literature (Cooper & Schindler, 2006, p. 143). Therefore, by using an exploratory approach, the barriers to EC adoption in SMEs can be extensively studied in the existing literature. The precursor to the quantitative analysis was the use of the existing literature to build the information required for further analysis. By combining the information presented in Chapter 2 and Chapter 3, a meta-analysis was conducted to reveal the factors associated with the adoption of EC in SMEs and the salient features of the SME operating environment.

Second, a meta-analysis was conducted to evaluate the existing literature. In order to perform the meta-analysis, a content analysis technique is employed to perform a qualitative data analysis to identify and explore CSFs in SMEs in Vietnam. According to Saunders, Lewis, and Thornhill (2009), there are three methods for conducting exploratory studies: (1) reviewing the existing literature, (2) interviewing experts in the research field, and (3) conducting focus group discussions. The information presented in Chapter 2 shows that EC activities in Vietnamese SMEs are still in their infancy. As a result, finding experts and conducting focus group discussions to further explore a deeper understanding about B2C EC activities in Vietnamese context seems to be problematic. Therefore, a qualitative type of analysis using the content analysis was performed to investigate important CSFs that have been identified in the literature that impact on the B2C EC adoption and

implementation in the Vietnamese SMEs. The content analysis allowed identification and to confirmation of the existing factors and explored new factors that may potentially influence the adoption and implementation of B2C EC in Vietnamese SMEs. The identification of important CSFs in B2C EC in the existing literature from 1999 to 2015 is presented in Chapter 5.

Evidence based on the literature reviewed is synthesised in this chapter. For example, theoretical evidence is presented in Chapter 2, and discussion related to the characteristics of Vietnamese SMEs, and the business environment were presented in Chapter 3. The potential CSFs that has been identified in the existing literature will be analysed in Chapter 5. Finally, a research framework that is relevant for EC adoption and implementation in the context of Vietnamese SMEs will be developed in this chapter.

Third, the information collected from the theoretical and empirical evidence and the results of content analysis provided the basis for a pilot study. The pilot study was conducted in order to confirm the validity of the proposed conceptual framework and subsequently explore contextual barriers and CSFs exclusively relevant to Vietnamese SMEs. The results of the pilot survey provided contextual information that was used in the development of the survey instrument for data collection and to collect information pertinent to the qualitative analysis.

Finally, descriptive and regression-based analyses using firm-level data were employed to test the validity of the research hypotheses. The firm-level data were collected using structured questionnaires distributed to selected firms engaged in B2C business. Using the data obtained from the actual survey, quantitative analysis was conducted using descriptive analysis to describe the profile of the SMEs in Vietnam. Accordingly, various statistical approaches, including logistic regression models, analysis of variance, principal component analysis and factor analysis were performed. The application of these statistical techniques provide insights into the nature of actual EC adoption and implementation in Vietnamese SMEs, including EC adoption patterns, influencing factors or barriers to EC development, and key factors that guarantee success in EC activities. The results of these analyses are presented in Chapter 6.

All of the research approaches employed in this study are consistent with the principles of qualitative and quantitative techniques applicable in IS studies. This mixed research design is adopted widely because of the rigour associated with enhancing the quality of the research findings (Cooper & Schindler, 2006). The salient features of the approaches presented above are provided in the next sub-sections.

4.2.1 Content Analysis

According to Harris and Suleiman (2003), content analysis is a suitable approach for investigating a communication phenomenon rather than behaviour or physical objects. Content analysis is also used to form and classify concepts (Sharp & Howard, 1996). The technique is also known as a method for quantifying qualitative data by obtaining frequency distributions, among others. Moreover, the content type of analysis plays a critical role in the scientific approach of testing stated hypotheses (Crowther & Lancaster, 2012).

It is imperative to present some features and key characteristics of this technique. The analysis has a long historical application. It was first used in the Scandinavian context (Rosengren, 1981). The approach has been used by scholars focusing on both qualitative or quantitative approaches in their research (Berelson, 1952). Subsequently, researchers regarded this method as a qualitative approach where coding of text data was assigned to precise categories, then the descriptions of the coded data were presented using statistics. An important consideration when using this approach is the requirement for the analyst to identify a unit to measure the qualitative data, which could be in the form of words, sentences or other contextual variables. However, researchers tend to use many words, synonyms or different expressions to describe one concept, thus making it difficult to analyse. Nevertheless, some authors have suggested a three-stage process to implement this method of analysis. According to Patton (1990), content analysis consists of identification, coding, and classification of the main trends in the summarised data. Also, Crowther and Lancaster (2012) stated that content analysis can be implemented in three stages: (1) determining a unit of analysis, (2) identifying the themes and relationships of the units, (3) developing explanations and relevant conclusions. The unit of analysis can be words, characters, themes, or topics (Malhotra, 2008). The themes and relationships of the units can be determined during the process of analysis or prior to the process, depending on the availability of a sufficient number of existing studies, and by way of analysing different theories put forward by the previous researchers. The first technique is known as a inductive technique, whereas the latter is called a deductive technique. Content analysis is used in the analysis of secondary information collected through a literature search, specifically to conduct meta-analysis. The secondary data are collected through extensive searching of the existing literature on relevant topics. In addition, another content analysis is conducted to analyse the responses obtained through the open-ended questions included in the survey instrument to understand the existing research context and to identify the most

important CSFs and barriers to implementing B2C EC in Vietnam. The results of the content analysis are presented in Chapter 5.

4.2.2 Descriptive Statistics

Descriptive statistics provide a profile of the research subject, whether it be a person, event, or situation. The results obtained by analysing the descriptive are used to answer questions like who, what, when, where and how a research subject is being investigated. The findings also relate to estimations of a population, and are often represented as frequencies, means or modes, and standard deviations (Samouel, Money, Babin, & Hair, 2003). These descriptive statistics may further be used to draw simple correlations amongst identified variables. Moreover, the descriptive type of research is a pre-requisite to carrying out causal research (Cooper & Schindler, 2006). In the present research, descriptive statistics provide the profile of firms engaged in B2C EC in Vietnam.

Accordingly, using firm-level data and data collected through a literature search allow the researcher to conduct a descriptive analysis of the patterns, identify the extent of adoption of B2C, and also examine the role of CSFs in operating day-to-day business activities. Descriptive analysis is also used to provide the existing profile of sampled SMEs in Vietnam for meeting the research purposes of this study.

4.2.3 Causal Research

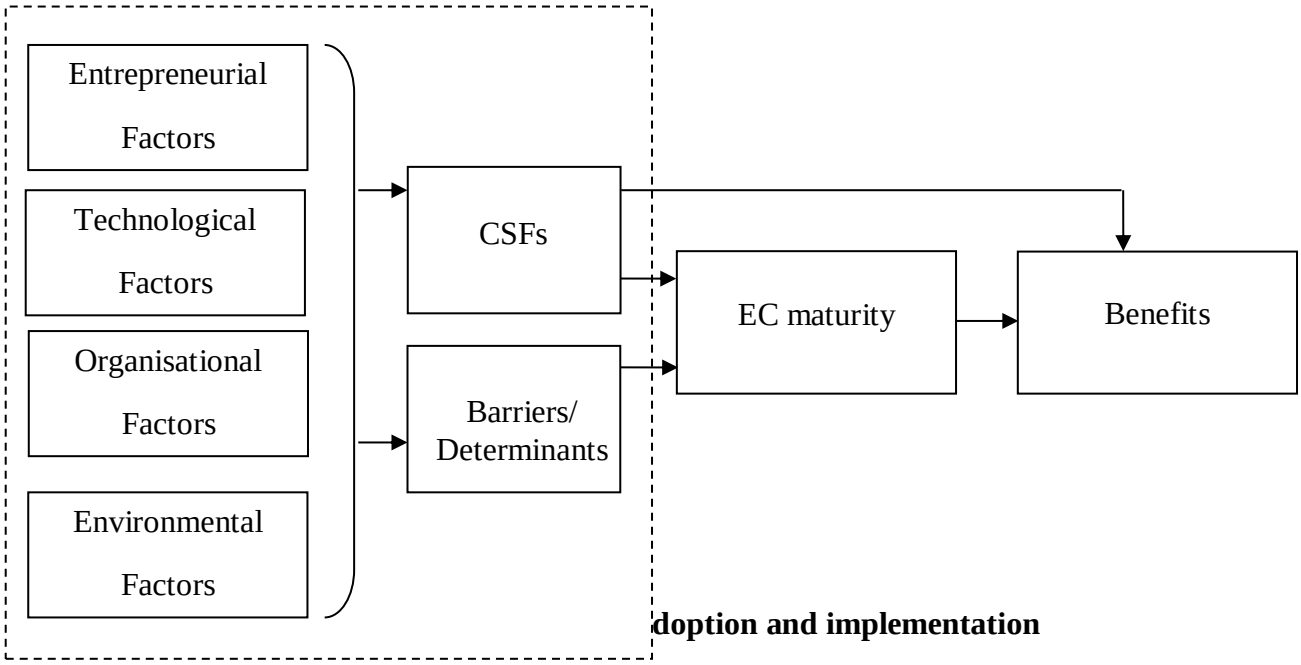
The overarching aim of causal research is to explain relationships among identified variables (in IS studies it can be referred to as exploratory survey). The method is also widely used to gather all possible information about a certain research subject (Yin, 2009). Causal research helps the researcher to generate relevant findings obtained from a sample as a representative of the total population of research subjects (Creswell, 2009). However, this method has a drawback, as it only provides information related to variables under consideration at a certain point in time. Also, this method cannot reveal the actual causes and processes occurring in a sample consisting of specific research subjects (Cornford & Smithson, 1996, as cited in Thi, 2006). Another disadvantage of this method is attributed to the widely quoted low response rate because of lack of willingness of informants to participate in the research process. The reasons for non-participation are attributed to the method's time consuming process and the non-friendly nature of the questionnaire design (Phipps, Butani, & Chun, 1995).

In order to apply this research method, one of the important assumptions that need to be fulfilled is sample selection. An appropriate sample should be drawn randomly from

the population to ensure an equal chance of all members of the population being selected (Creswell, 2009). In other words, the sample should be representative of all characteristics of the population. The randomly selected sample also guarantees validity of the statistical inferences that that can be generalised to the population (Myers & Well, 2003). Clearly, this method has high potential for use in the current study due to the availability of the population, as all B2C EC enterprises are public listed on the Vietnamese government Website. Hence, randomly selected enterprises are included in this study. The variables included in the questionnaire are further divided into independent and dependent variables on the basis of the hypothesised relationships between them and the theoretical evidence gathered. The relationships between these variables will confirm or reject the hypotheses stated in section 4.4. The relationships between the independent variables, such as the TOE constructs, and the dependent variables, such as the extent of usage and benefits of EC activities, will be investigated and analysed in Chapter 6.

4.3 The Conceptual Framework

Based on the discussion presented in the previous sections, the following conceptual framework that encompasses variables of interest has been proposed by the researcher (Figure 4.1). The model consists of four sections that outline the relative importance of entrepreneurial, technological, organisational, and environmental factors that may potentially influence the extent of EC adoption and use in Vietnamese SMEs. The left side of the diagram contains factors that influence the level of EC development, and which are able to play a barrier/determinant role or a CSF role. The second column shows EC maturity construct. The last part of the diagram describes the benefits derived by Vietnamese SMEs from engaging in EC activities.



(Source: Researcher's own compilation)

In view of the underlying research questions in this study, the following sections provide a contextualisation of how the dependent and independent variables are defined and the relevant hypotheses are also stated.

4.4 Contextualisation and Research Hypotheses

In order to address the goal of the study, the relationships amongst the dependent and the independent variables need to be examined using regression-based approaches. For instance, the dependent variables consist of constructs used to measure the extent of EC usage and performance outcomes from EC adoption in Vietnamese SMEs, while the independent variables refer to the inclusion of potential variables that may impact on EC adoption and implementation processes in these enterprises. These constructs are based on the theoretical evidence presented in Chapter 2, and Chapter 5, and the existing evidence related to the unique business characteristics of SMEs discussed in Chapter 3.

4.4.1 Dependent Variables

4.4.1.1 EC adoption measurement

As discussed in Chapter 2, EC adoption variables selection follows the SOG-e Model proposed by McKay, Marshall, et al. (2000). The adoption of EC has different growth stages, from simple to complicated stages; the subsequent stages are related to the business's integration of a static Website, an interactive Website, a transaction Website,

and/or an integrated Website. The definitions of these stages are outlined in Chapter 2, and are based on the uptake and adoption of EC in Vietnam, whether it be at the infancy or maturity level. The criteria used in the present study to distinguish between various stages is based on the theoretical descriptions outlined in Chapter 2. Therefore, it is necessary to look closely at the real practice of EC adoption and implementation in the context of Vietnamese SMEs.

In Vietnam, the extent of adoption of EC is based on four different levels (VECITA, 2013), as described below:

Level 1: Enterprises present only a static Website that includes basic information about the enterprise and its products and services.

Level 2: Enterprises offer a more advanced Website that has more complicated functionalities and interactions that the enterprise maintains with its viewers and customers in the electronic online space.

Level 3: Enterprises prepare to start selling online. The e-transaction process is slow and unsecured due to the lack of a local database to support e-transactions.

Level 4: There is a link between enterprises' Websites and local network databases. The process of data transfer occurs automatically, and the systems save manpower, resulting in the cost-effectiveness of the business activities and thus, improving efficiency.

Based on the definition of Website development, the VECITA report also shows that 26% of enterprises have Website development at Level 1, whereas 41% of enterprises Websites are at Level 2, and 26% and 7% account for Level 3 and Level 4, respectively, as presented in Figure 4.1. However, the criteria used for the aforementioned classification are very generic and may not reflect the complicated and actual adoption and implementation of EC in Vietnamese SMEs.

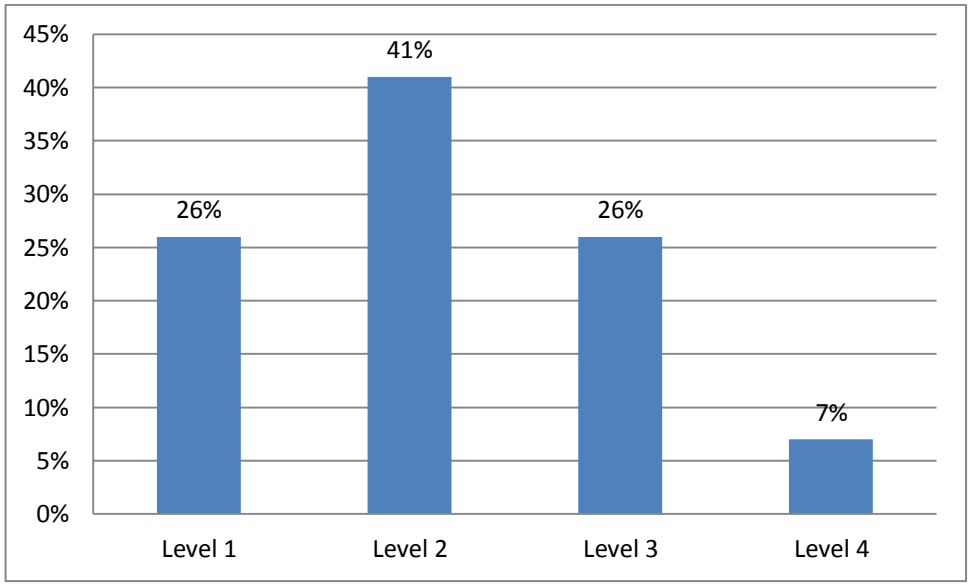


Figure 4.2: Contribution of Vietnam Website maturity
(Source: VECITA, 2013)

In order to identify CSFs and barriers to B2C EC in the context of Vietnamese SMEs, the variable EC maturity is perceived to be at various stages, as outlined in Table 4.1. The level of maturity of each enterprise also indicates their level of capability. Existing evidence shows that enterprises with higher capability levels obtain better benefits from conducting EC activities (Molla & Heeks, 2007; Zhu & Kraemer, 2002). The information presented in Table 4.1 is useful for testing the following hypotheses:

H_{00}: EC maturity can be classified into a set of sequential stages in Vietnamese SMEs.
H_{01}: EC maturity will be positively correlated to EC benefits in Vietnamese SMEs.

Table 4.1: EC maturity in Vietnam

Stage	Stages	Descriptions
1	Website presence *In this stage, enterprises setup a static Website with basic information about the enterprise's products/service offerings. The purpose for employing the Website is to attract new customers.*	• Have a static Website • Contents on the Website contain information about company's internal environment and their products. • Company uses e-mail as the most common type of communication tool. • No integration with internal and/or external processes and the Website is primarily used to attract new customers through company advertisement.
2	Interactive online presence *In this stage, enterprises apply Internet technologies to communicate with their customers, resolve complaints and receive feedback from them. Enterprise's Websites have more complicated functions.*	• Interactive online presence: acceptance of queries, e-mail, and other functions are used to communicate with customers. • Online catalogue is commonly used.
3	Prepare to sell online *In this stage, the company starts to sell online and accept online orders from customers. The payments are made by traditional methods, such as COD and bank transfer, to ensure safe transactions.*	• Prepare to sell online. • Accepting and ordering online using e-mail, telephone, and via their Website using shopping cart, but there is no local database link to the Website. • Transaction processes are slow and unsecured (no money transaction online). Most payment methods used are COD and transferring money through bank accounts.
4	Transactive Web *In this stage, enterprises can manage the online payment process through their Website system. They connect the front-end database in the Website to the local back-end database and employ extensive staff, including IT and business staff, for conducting EC activities.*	• Able to sell online (money transaction), including online payment and customer service (all these processes are automatic). • Accepting a variety payment forms from consumers using online payment systems (COD, bank account, master or credit card, e-wallet, scratching cards). • Integration of online front-end and back-end systems. • Dedicated staff with technical expertise with the help of business-oriented staff.

4.4.1.2 EC success measurement

The theory of CSFs is relevant to the success, achievement, and measurement of EC. Therefore, it is critical to determine and define the EC success measurement variable. However, the benefits of EC success are not easy to measure because of inconsistencies in measurement techniques employed by different enterprises (Lin & Pervan, 2003). There are many measures that are used in the extant literature to measure EC success, and these are outlined in Table 4.2. EC success can be seen as growth in the *customer base* (Peppers & Rogers, 1997), *increased sales* (David & Robert, 1998), *profit generation* (Tan & Teo, 2000), *return on investment* (Barua, Konana, Whinston, & Fang, 2001), *customer lock-in* (Shapiro & Varian, 1999), *productivity* (Barua et al., 2001), *operational excellence* (Quinn, 1999), *global reach* (Demers & Lev, 2001), *customer loyalty* (Molla & Licker, 2001), *stickiness* (Demers & Lev, 2001), *customer responsiveness* (Hoogeweegen & Wagennar, 1996; Teo & Too, 2000), *customer acquisition* (Barua et al., 2001), and *customer retention* (Parthasarathy & Bhattacherjee, 1998).

Evidence from the existing literature shows that researchers use various metrics to measure EC success. It is argued that economic returns in the form of sales, revenue, and cost of operations, and customer perspectives, such as customer purchase intention, loyalty, satisfaction, re-purchase intention, and value should be contained in the variables due to the nature of B2C EC. Due to the exploratory goals of the research, this thesis will test the benefit measures. For example, some benefit constructs are widely accepted in the existing literature, including reduced operation costs, and marketing costs, extend the firm's reach, product/service differentiation, improved process speed, customer relationships, company image, inter-organisational communication, increased revenue, competitive position, and internal communication (Horsti, Tuunainen, & Tolonen, 2005; Lee & Cata, 2005; Molla & Heeks, 2007). These measurements will be re-tested in the pilot study to explore the potential outcomes that Vietnamese SMEs experience, and then will be confirmed in the main survey.

Table 4.2: List of measures of success

No.	Factors	Sources
1	Extending market reach	(Lee & Cata, 2005); (Molla & Heeks, 2007); (Peppers & Rogers, 1997); (Demers & Lev, 2001); (Madeja & Schoder, 2002); (Horsti et al., 2005); (Wang, Huang, & Lee, 2005)
2	Developed new market	(Madeja & Schoder, 2002)
3	Product/service differentiation	(Molla & Heeks, 2007)
4	Offer new service	(Madeja & Schoder, 2002); (Wang et al., 2005)
5	Increased customer loyalty and retention	(Molla & Heeks, 2007); (Shapiro & Varian, 1999); (Molla & Licker, 2001); (Madeja & Schoder, 2002); (Horsti et al., 2005)
6	Improved revenue	(Molla & Heeks, 2007); (David & Robert, 1998); (Tan & Teo, 2000); (Madeja & Schoder, 2002); (Horsti et al., 2005); (Wang et al., 2005)
7	Improved competitive position	(Lee & Cata, 2005); (Molla & Heeks, 2007)
8	Improved customer relationship	(Lee & Cata, 2005); (Molla & Heeks, 2007); (Hoogeweegen & Wagennar, 1996; Teo & Too, 2000); (Madeja & Schoder, 2002)
9	Customer satisfaction	(Wang et al., 2005); (Horsti et al., 2005);
10	Improved internal communication	(Lee & Cata, 2005); (Molla & Heeks, 2007)
11	Improved external communication	(Molla & Heeks, 2007)
12	Improved process speed	(Lee & Cata, 2005); (Molla & Heeks, 2007); (Barua et al., 2001); (Huang et al., 2007)
13	Reduced operation cost	(Lee & Cata, 2005); (Molla & Heeks, 2007); (Horsti et al., 2005); (Huang et al., 2007)
14	Reduced cost of purchasing and procurement	(Molla & Heeks, 2007); (Madeja & Schoder, 2002); (Horsti et al., 2005); (Huang et al., 2007)
15	Improved supplier relationship	(Molla & Heeks, 2007)
16	Customer satisfaction	(Huang et al., 2007); (Horsti et al., 2005); (Sebora, Lee, & Sukasame, 2009)
17	Reduced marketing costs	(Huang et al., 2007); (Horsti et al., 2005); (Sebora et al., 2009)
18	customer acquisition	(Barua et al., 2001)
19	Reduced costs of maintaining up-to-date company information	(Lee & Cata, 2005); (Molla & Heeks, 2007); (Horsti et al., 2005)
20	Improved company image	(Molla & Heeks, 2007); (Madeja & Schoder, 2002); (Wang et al., 2005)
21	Company Value	(Wang et al., 2005)
22	ROI	(Barua et al., 2001); (Horsti et al., 2005)
23	Productivity	(Barua et al., 2001)
24	Reduce sale cost	(Madeja & Schoder, 2002); (Wang et al., 2005); (Huang et al., 2007)

Continue in next page

Table 4.2: Continued.

No.	Factors	Sources
25	Sale growth	(Horsti et al., 2005); (Wang et al., 2005); (Sebora et al., 2009); (Sebora et al., 2009)
26	Profitability	(Horsti et al., 2005); (Wang et al., 2005); (Huang et al., 2007)
27	Increase customer value	(Horsti et al., 2005)
28	Increase customer views	(Horsti et al., 2005); (Sebora et al., 2009)
29	Capital turnover	(Wang et al., 2005); (Huang et al., 2007)

(Source: Researcher's own compilation)

4.4.2 Independent Variables

Extant literature shows that the variables influencing EC adoption can be investigated by analysing various prominent categories that relate to technological, organisational, and environmental dimensions. From the Diffusion of Innovation Theory, there are five variables that impact on EC adoption and implementation (Rogers, 2003):

- Perceptions of attributes of innovations such as relative advantage, compatibility, complexity, trialability, and observability;
- Type and process of decision-making (optional, collective, authority);
- Communication channels (mass media, interpersonal);
- Social norms; and
- Roles of change agents.

The following sections present how research scholars have used the identified factors to explain the EC adoption and implementation phenomena. The potential factors that impact on Vietnamese SMEs will be determined based on the synthesis of theoretical/ empirical evidence outlined in Chapter 2, and the nature of the research context discussed in Chapter 3.

4.4.2.1 Technological factors

Perceived relative advantage relates to the perception of how a newly introduced idea can bring benefits to the users over the existing practices. This dimension has also been tested by many research scholars in previous studies (Huynh et al., 2012; Kendall, Tung, Chua, Ng, & Tan, 2001; Li, Lai, & Wang, 2010; Limthongchai & Speece, 2003; Scupola, 2009; Seyal & Rahman, 2003). Generally, relative advantage in terms of using EC is related to reducing the costs, improving the customer relationships, offering better customer service, enhancing the market share, and increasing market revenue. Huynh et al.

(2012) examined these factors on adopters and non-adopters and identified the perceptions of the sample through a simple Website innovation. Results obtained indicated that even adopters with little deeper involvement in EC will rate low advantages associated with the innovation within the context of SMEs in the Pacific countries (APEC, 1999). The present study recognises that EC adopters in Vietnamese SMEs are those with a Website presence showing only low capabilities, hypothesised as:

H_1: Enterprises with low capabilities perceive the relative advantage dimension of EC differently to enterprises with higher capabilities.

Compatibility refers to the perceptions of potential adopters about the extent of consistency between a new idea and an existing one. Many researchers have used this dimension to investigate information systems adoption (Chong et al., 2009; Huynh et al., 2012; Lin & Lin, 2008; Wang, Wang, & Yang, 2010; Yu-hui, 2008; Zhu, Dong, et al., 2006). In the present study, it is hypothesised that the extent of perception of the compatibility dimension varies amongst the EC adopters in the context of Vietnamese SMEs, depending on the stage of adoption:

H_2: Enterprises with low capabilities perceive the compatibility dimension of EC differently to enterprises with higher capabilities.

Complexity refers to potential adopters' perceptions of the difficulty associated with the use of an innovation. To adopt EC, an enterprise is required to use complex innovations that, in turn, leads to meeting the requirements of the organisational workforce, the available operational resources, and technical competencies (Cooper & Zmud, 1990). These resources refer to the presence of adequate infrastructure like computers and IT, the technical skills of employees, and training programs that need to be installed to maintain EC technologies (Chong, 2004; Scupola, 2001). Lee and Cata (2005) added that there are three levels of complexity in using Internet technologies, namely, using the Internet as a delivery channel by creating a corporate Web, adopting Internet applications to collaborate e-mail and other communication applications are used in the enterprises, and integrating Internet technologies with the internal systems of the enterprises. In terms of using B2C EC applications, the level of complexity relates to the integration of business activities into EC applications, and collaboration of staff to work well with the EC solutions. This dimension

may be considered to be a barrier in the Vietnamese context due to lack of adequate resources and weaknesses associated with the skills of the SME managers. Additionally, there exists significant differences between firms at the advanced stages and those in the less advanced stages (Morais, Pires, & Gonçalves, 2012; Rao, Metts, & Monge, 2003; Teo & Pian, 2004). The association of the technological dimension complexity with the EC adoption is hypothesised to be:

H_3: Complexity is perceived as a barrier to EC development.

H_4: Enterprises with lower capabilities perceive the complexity dimension of EC differently to enterprises with higher capabilities.

Trialability is the extent that an idea might be experimented with on a limited basis. This factor can be explained in the EC context as the extent to which the start-up cost for carrying out a pilot test to experience EC is high or low (Chong & Pervan, 2007; Tan & Teo, 2000). Owners of Vietnamese SMEs with low-level management skills may want to try an EC innovation on a trial basis prior to getting deeply involved in EC activities to ensure the safety of the consideration and implementation. Therefore it is hypothesised that:

H_5: Enterprises with lower capabilities perceive the trialability dimension of EC differently to enterprises with higher capabilities.

Observability is the extent to which the outcomes of EC are readily visible to enterprises. This factor plays an important role in the DOI Theory. In terms of EC context, Chong and Pervan (2007) state that observability refers to an enterprise's vision towards the many advantages associated with the use of EC, competitors' use of EC, and the success of EC adoption from other firms. In the Vietnamese context, EC adoption is in its infancy, thus the observability of benefits in EC activities is believed to encourage SMEs to employ and develop EC business extensively. Hence, it can be hypothesised that:

H_6: Enterprises with lower capabilities perceive the observability dimension of EC differently to enterprises with higher capabilities.

In order to embed EC and conduct EC-based transactions, SMEs have to deal with online customers, store their information and prevent the data from being hacked. This

might be a major concern for SME managers in the Vietnamese context due to lack of sufficient infrastructure and government support. In addition, as stated in Chapter 3, conducting business in Vietnamese SMEs is heavily reliant upon social relationships. Therefore, conducting business via EC, which does not involve social relationships, might have a massive impact on their existing business and the extent of EC usage by the SMEs. Consequently, enterprises with a higher EC capacity may be protected from the negative impacts of using EC due to less risk-oriented perceptions. The influence of this dimension has been widely investigated in the existing literature (Hamill & Gregory, 1997; Huynh et al., 2012; Wilson et al., 2008).Therefore it is hypothesised that:

H_7: Enterprises with lower capabilities perceive the perceived risk dimension of EC differently to enterprises with higher capabilities.

4.4.2.2 Organisational factors

As stated in Chapter 2, *firm size* has been widely identified in the existing literature as an important predictor of adoption of EC. In this study, the number of employees is used as a criterion to determine the size of a firm. Accordingly, it is hypothesised that:

H_8: Firm size positively influences EC maturity in Vietnamese SMEs.

CEOs and top management support plays a critical role in adopting and implementing EC in SMEs. This factor includes commitment towards IS/IT adoption (Chieochan, Lindley, Dunn, & Wagga, 2000; Mehrtens, Cragg, & Mills, 2001; Rashid, 2001; Seyal & Rahman, 2003), managers' skills (Chieochan et al., 2000; Jeon, Han, & Lee, 2006; Rashid, 2001), and managers' support (Grandon & Pearson, 2004; Wongpinunwatana & Lertwongsatien, 2003). However, the existing evidence in Vietnam SMEs shows that their owners focus on short-term profit generation rather than long-term growth strategies. Similarly, return from investment on IT is perceived to take a long time and the commitment of key leaders in leading the project-related processes is identified to be pivotal (Pham & Nguyen, 2013; Segars & Chatterjee, 2010). Vietnamese SMEs are also identified to lack sufficient management skills. Henceforth, it is hypothesised that:

H_9: Management support is a potential barrier to EC development in Vietnamese SMEs.

In order to adopt EC, SMEs need to have adequate resources. The existing literature shows that resource deployment is one of the best predictors of IS/IT adoption (Grandon & Pearson, 2004; Hong & Zhu, 2006; Iacovou et al., 1995; Oliveira & Martins, 2010; Scupola, 2009; Zhu & Kraemer, 2005). Vietnamese SMEs in this research context are expected to be limited in terms of finance, technology, innovation, human resources, and management skills. Therefore, it is hypothesised as:

H_{10}: Enterprise resource availability will positively influence EC maturity in Vietnamese SMEs.

4.4.2.3 Environmental factors

The discussion presented in Chapter 2 showed that SMEs have unique characteristics and they are deficient in technological, financial, and human resources. It has been identified that the top managers of SMEs usually have low levels of education, have little knowledge about technology, and are limited by poor management skills. As a result, the extent of EC adoption might be very dependent on the support of vendors, consultants, and trading partners. These factors have been widely acknowledged in the existing literature (Grandon & Pearson, 2004; Hong & Zhu, 2006; Ifinedo, 2011; Oliveira & Martins, 2010; Teo, Chan, & Parker, 2004; Wilson et al., 2008; Zhu, Dong, et al., 2006; Zhu, Kraemer, et al., 2003). Therefore, it is hypothesised that:

H_{11}: Availability and support of technology vendors and consultants positively affect EC maturity in Vietnamese SMEs.

Many studies show that SMEs with poor resources only adopt EC with support from government (Chong & Pervan, 2007; Grandon & Pearson, 2004; Jutla, Bodorik, & Dhaliwal, 2002; Scupola, 2009; Zhu, Kraemer, & Dedrick, 2004). A majority of the Vietnamese SMEs have been identified to have a private and family-owned type of ownership; they face discrimination in the society, and have been ignored for a longer period of time by the government. Thus, these SMEs need further support from government to adopt and develop EC activities. Therefore, it is hypothesised that:

H_{12}: Government support positively influences EC maturity in Vietnamese SMEs.

Similarly, in a study about EC adoption in South Africa, Molla and Licker (2005a) showed that SMEs can have support from industrial associations. This factor is confirmed in the study conducted by Chong and Pervan (2007). SMEs in this research context showed that they have weak clusters and networking capabilities; therefore, Vietnamese SMEs receive little support from industrial associations.

H_{13}: Lack of support from associations is a potential barrier to EC development in Vietnamese SMEs.

Another factor forcing SMEs to adopt EC is prevailing competition from the marketing environment. This reflects the degree of competitive intensity within the industry where SMEs operate. The studies reviewed in Chapter 2 showed strong evidence of the existing literature. On the other hand, Vietnamese SMEs conduct business in a very tough competitive environment. Therefore, pressures experienced from their competitors and/or trading partners may lead them to adopt and develop EC.

H_{14}: Competition pressure positively influences the EC maturity in Vietnamese SMEs.

Customer-related factors have been identified as important facilitators of EC adoption in the extant literature. This factor has been tested by many researchers (Chong & Pervan, 2007; Grandon & Pearson, 2004; Huynh et al., 2012; Kivijärvi, Laukkanen, & Cruz, 2007; Wilson et al., 2008; Zhu, Kraemer, et al., 2003). The discussion presented in Chapter 2 showed that the main business for Vietnamese SMEs comes from local customers. In addition, the nature of B2C EC leads to the strong influence exerted by customers demanding that SMEs adopt EC. On the other hand, conducting online transactions requires trust between customers and sellers and the use of credit cards. The level of trust placed by Vietnamese customers in online transactions and the level of credit card usage is identified to be low due to customers' offline shopping patterns and the popularity of making payments by cash. Therefore, customers' online trust and credit card usage are predicted to be barriers to EC adoption. Henceforth, it is hypothesised that:

H_{15}: Customers' online trust is a potential barrier to EC development in Vietnamese SMEs.
H_{16}: Credit card usage is a potential barrier to EC development in Vietnamese SMEs.

EC is an innovation that includes a combination of various software and other Internet-based applications and hardware, including ICT infrastructure. In order to adopt B2C EC, adequate ICT and financial infrastructure, apart from government support, is much needed to support all online transaction processes. These factors are therefore identified to be predictors in EC adoption (Chitura et al., 2008; Farhoomand, Tuunainen, & Yee, 2000; Huynh et al., 2012; Kshetri, 2007; Molla & Licker, 2005b). Low levels of development of these factors in Vietnam may pose significant problems for EC adoption.

H_{17}: Poor ICT infrastructure is a potential barrier to EC development in Vietnamese SMEs.
H_{18}: Poor financial infrastructure is a potential barrier to EC development in Vietnamese SMEs.

Other factors that has been identified to be critical predictors of EC development in developing countries include the level of logistics development and low levels of Internet bandwidth (Chitura et al., 2008; Hawk, 2004; Kshetri, 2007). These characteristics are evident in the current research context. Hence, these factors may have an impact on developing EC, thus leading to the formulation of the following hypotheses:

H_{19}: Good Internet connections positively influence the EC maturity in Vietnamese SMEs.
H_{20}: Poor logistics systems are a potential barrier to EC development in Vietnamese SMEs.

A sound legal system is a critical requirement for conducting EC (Chitura et al., 2008; Huynh et al., 2012; Kraemer, Dedrick, Melville, & Zhu, 2006; Kshetri, 2007; Molla & Licker, 2005a). It is evident that EC adoption is in its infancy in Vietnam. As a result, the weak legal system is identified to be a potential barrier to developing EC, thus leading to the following hypotheses:

H_{21}: A weak legal system is a potential barrier to EC development in Vietnamese SMEs.

The cost of EC solutions are the costs associated with building the Website, running the business relating to the Website, and maintaining the systems. Setting up a Website to

sell online is not costly, but running and maintaining an EC business requires huge financial commitment from SMEs (AlGhamdi, 2014; Chitura et al., 2008; Molla & Licker, 2005a). Shelly and Rosenblatt (2011) conclude that these costs include the initial cost of installing software and hardware components, the cost of training staff, business development and maintenance costs. This finding is consistent with observations made by Dibrell, Davis, and Craig (2008), and Wu, Yeniyurt, Kim, and Cavusgil (2006). Also, Premkumar (2003) added that the cost of the project is a real problem that hinders small businesses from adopting information technologies. In the context of Vietnamese SMEs, in addition to the high cost of running and maintenance, the lack of financial resources is seen as an impending factor for EC development. Therefore, this study seeks to test the following hypothesis:

H_{22}: Costs of EC solution are a potential barrier to EC development in Vietnamese SMEs.

Finding adequate IS/IT staff to run EC-based activities is identified as another barrier, as noted in the existing literature by some researchers (Hamill & Gregory, 1997; Kaynak et al., 2005; Wilson et al., 2008). The poor quality of human resources in enterprises, the lack of financial resources, and discrimination from the society make it difficult for SMEs to recruit quality staff members to run EC-based business activities. Therefore, whether or not the availability of IS/IT staff is a barrier to Vietnamese SMEs conducting EC activities is to be tested. Therefore, it is hypothesised that:

H_{23}: The lack of availability of IS/IT staff is a potential barrier to EC development in Vietnamese SMEs.

The influence exerted by communication channels on EC development is well established in the existing literature (Chong & Pervan, 2007). The business environment of Vietnamese SMEs is highly informal, as SME activities are heavily reliant on social relationships. Rand and Tarp (2010) examined the characteristics of Vietnamese SMEs and the findings obtained revealed that the complexity of social relationships has a positive impact on SME innovativeness. Therefore, it is hypothesised that:

H_{24}: Good communication channels positively influence the EC maturity in Vietnamese SMEs.

4.4.2.4 Critical success factors

In addition to the factors outlined above, it is also important to evaluate the effects of the factors already identified in the literature as critical success factors (CSFs). Discussion related to these factors will be presented in Chapter 5. While it is not the intention of this study to pre-empt the effects of these factors, it is in the best interest of the researcher and the study to test whether there is evidence to support the influence of these factors in the context of Vietnamese SMEs.

As mentioned in Chapter 2, adoption cannot promise the desired benefits that enterprises want. The concept of adoption factors and success factors have not been well defined by many researchers, as they tend to use alternative terms like facilitators (Keeling et al ,2000), enablers (Levy et al, 2005), and best practices (Jeffcoate, Chappell, & Feindt, 2002). Therefore, in this thesis, all of the variables identified as facilitators leading to best practice will be examined separately. Thus, the relationships of proposed factors with EC benefit variables, and EC maturity variables will be tested. The outcomes of the statistical procedures will determine the roles of each of these factors in EC benefits and maturity. It is hypothesised that:

H_{C0}*: E-commerce success is influenced by a set of critical success factors specific to Vietnamese SMEs.*

E-commerce strategy: Careful planning of the EC strategy ensures business success. A good EC plan needs to offer flexible solutions for the businesses (Jamil & Ahmad, 2012). The EC implementation requires comprehensive resources that a business needs to look at from both business and technological perspectives (Lee & Cata, 2005). Also, the impact of new business on the existing one should take into account the innovative capabilities of the new plan (Vijayaraman & Bhatia, 2002). In other words, the new plan needs to build upon the existing business models. The owners of an EC business have to take into account the requirements of their customers, and focus on offering unique product value to the customers. The strategy development needs to assess the unique advantages the business offers over the competitors (Esichaikul & Chavananon, 2001). Remus (2006) suggests that a case-by-case analysis should be conducted to gain all information about EC implementation, and to identify of risk factors and CSFs. It is further added that a good

strategy needs to have well-balanced planning and time management rules, appropriate standards and templates, suitable infrastructure, support for team building, and facilitating conditions for teamwork. The discussion presented in Chapter 3 revealed that some SMEs try to set up an EC business to have a first-mover advantage. These owners fail, however, because of lack of appropriate long-term vision towards EC implementation. Therefore, a good EC strategy might act as a CSF to EC implementation in the context of Vietnamese SMEs. It is hypothesised that:

H_{C1}: A good EC strategy will positively influence the EC success in Vietnamese SMEs.

Clear goals, objectives and planning: The most important requirement for a good EC strategy is clear goals and objectives. The criteria for clear goals and objectives are specific, operational, and a reflection of the direction of the project. Planners have to clearly identify the benefits and advantages associated with EC implementation(Esichaikul & Chavananon, 2001). Appropriate goals should include identification of unmet and unpredictable customer demands, and a focus on creating unique product value to customers (Yuhas, 2000, as cited in Vijayaraman & Bhatia, 2002). Specific objectives can be related to the scalability of the project, the impact exerted on customers, and the timeframe of the project (Collins, 2001). Other aspects that need to be taken into consideration relate to a feasible budget and schedule predictions (Deželak et al., 2006). In the Vietnamese context, most owners of SMEs lack sufficient management skills, leading to difficulties in articulating clear objectives and goals. Accomplishing the above stated planning will avoid the pitfalls of EC ventures in Vietnamese SMEs. It is, therefore, hypothesised that:

H_{C2}: A clear plan positively influences the EC success in Vietnamese SMEs.

Top management support: As mentioned earlier, top management support is identified to be a critical factor throughout the implementation of an EC project. Leaders have to continuously supervise the various phases of the project, and set out clear directions, as well as amend long-term or short-term priorities when needed. It is hypothesised that:

H_{C3}: Top management support positively influences EC success in Vietnamese SMEs.

Well-prepared HR for EC implementation: This factor refers to equipping trained staff with the necessary skills and competencies required for implementing the EC project. Well-prepared and well-trained staff are essential for managing the various technologies (Sung, 2004) and business activities in the EC initiative (Esichaikul & Chavananon, 2001). A flexible workforce is necessary for understanding rapid business changes during EC adoption and implementation (Jamil & Ahmad, 2012). Therefore, project champions play a vital role as they take responsibility for the whole plan by transferring information from top managers, creating a facilitating environment and introducing the changes to users (Deželak et al., 2006). In the Vietnamese context, there seems to be lack of a well-qualified workforce for conducting EC activities. In addition, low financial capacities, discrimination from the society, and uneven exposure to the ICT infrastructure create barriers for SMEs in recruiting trained and well-equipped staff. Hence, most SMEs have to provide additional education for existing employees to support EC initiatives. It is hypothesised that:

H_{C4}: Well-prepared HR positively influences the EC success in Vietnamese SMEs.

Provide a good education and training to employees: It is recognised that incentive-based structures improve the technical capabilities of the staff (Wang et al., 2005). The owners of enterprises also need to ensure that knowledge is transferred from external consultants to internal employees in an open communication environment within the enterprise through regular project meetings or informal chats in office gallery (Poon & Lau, 2006) or on the enterprise's intranet (Deželak et al., 2006). These types of communication also help to minimise resistance to change in the enterprise. In the Vietnamese context, finding a suitable workforce to support EC activities and keep them intact throughout is challenging due to the lack of appropriate financial resources. The current situation is that most SMEs need to train their existing staff to build the EC-based business. As a result, a good training plan is expected to guarantee the success of the EC activities. Hence, it is hypothesised that:

H_{C5}: A good training program positively influences the EC success in Vietnamese SMEs.

Offering great value products: As an e-retailer, offering great value products is a critical competitive tool in the marketplace. This factor refers to a variety of product

offerings (Horsti et al., 2005; Laosethakul & Boulton, 2007; Lin & Fu, 2012), complemented with low prices (Amiri, 2010; Elliot, 2002; Huang & He, 2011; Sung, 2004; Zhu, Ho, Tang, & Chen, 2003), and good quality and branded products (Esichaikul & Chavananon, 2001; Lin & Fu, 2012). In the Vietnamese context, poor quality and fake goods enter the marketplace, thus creating a lack of trust about product quality amongst customers. Therefore, it is hypothesised that:

H_{C6}: Offering value-added products positively influences EC success in Vietnamese SMEs.

Great services: One of the predicted CSFs within the B2C EC context is offering great services. By employing Internet technologies, enterprises can quickly interact with their customers and motivate the customers to become involved in online purchasing procedures. These activities create close relationships between enterprises and their customers, therefore, raising customers' expectations. In order to provide great services and meet customers' expectations, enterprises need to set up interactive components like chat room, e-mails (Lee, Suh, & Hwang, 2002), call centres and online chats (Laosethakul & Boulton, 2007). Enterprises use these applications to interact with customers, as this initiative helps to answer a range of customer queries, such as clarifying information about products and services, policies related to returns, and assisting purchase processes. A great service also requires offering a faster response to customers queries (Dubelaar, Sohal, & Savic, 2005; Huang et al., 2007; Jamil & Ahmad, 2012; Lee et al., 2002; Liu & Arnett, 2000; Plant, Willcocks, & Olson, 2003; Sukasame, 2005; Sung, 2004). Provision of greater service quality by taking care of the timely delivery of products and service orders placed by the customers is also considered to be important (Borges, Hoppen, & Luce, 2009; Duffy & Dale, 2002; Huang et al., 2007; Jamil & Ahmad, 2012; Laosethakul & Boulton, 2007; Lin & Fu, 2012; Sung, 2004; Xu, 2005; Zhu, Ho, et al., 2003). Also required is the introduction of easy payment methods (Lin & Fu, 2012; Sung, 2004) that ensure customers' transaction details are safe and secure. Last but not least, providing value-added service offerings, including refunds and return of product and services, brings utmost satisfaction to customers (Dubelaar et al., 2005; Elliot, 2002; Lin & Fu, 2012). Many of the research contexts have shown that employing effective services ensures the trust between the enterprises and their customers (Sekhon, Roy, Shergill, & Pritchard, 2013), thus will improves customers' motivation to participate in online transactions. In the Vietnamese context, customers can easily find desired products and services within the proximity of

their residences because of the prevailing business culture. In order to compete with the traditional modes of business practices as well as their competitors, SMEs may need to offer great services to customer to achieve success. It is hypothesised that:

H_{C7}: Offering a great value added service positively influences the EC success in Vietnamese SMEs.

Good marketing techniques: Good marketing techniques guarantee that business acquires new customers and retains the existing and new customers throughout the customer's lifetime. Elliot (2002) showed that these activities required the need to focus not only on identifying customer acquisition cost, but also on customer fulfilment needs by way of offering a range of products and services that meet customers' demands. Internet technologies enable enterprises to collect customer data easily. In order to understand customers' needs, collecting customers' details and storing them in a database and meeting customers' requirements is perceived to be an important CSF for enhancing EC activities (Dubelaar et al., 2005; Lee et al., 2002; Phan, 2003; Plant et al., 2003). A good advertising campaign, such as conducting surveys to determine customers' requirements or feedback programs, is necessary to attract new customers and retain existing customers (Dubelaar et al., 2005; Lin & Fu, 2012). Building brand also impacts on enterprises' performance and growth, especially in the SME context (Laukkanen, Nagy, Hirvonen, Reijonen, & Pasanen, 2013; Reijonen, Párdányi, Tuominen, Laukkanen, & Komppula, 2014). An effective combination of online and offline marketing is also very important (Dubelaar et al., 2005; Gide & Wu, 2006; Laosethakul & Boulton, 2007; Vijayaraman & Bhatia, 2002). Thus, a strong focus on online marketing is critical in enhancing B2C EC activities (Dubelaar et al., 2005; Duffy & Dale, 2002; Gide & Wu, 2006; Lee et al., 2002; Millard, Havlicek, & Ticha, 2004). It is evident that Vietnamese customer behaviour relies heavily on recommendations in the form of word-of-mouth communication from relatives and friends. Applying effective marketing techniques will ensure that SME customers are retained for their lifetime. Therefore, it is hypothesised that:

H_{C8}: Good marketing techniques positively influence the EC success in Vietnamese SMEs.

Stable, secure, and easy to use system: One of the CSFs needed for B2C EC is well developed Websites and related systems. This factor is also related to the aspects of ease of

use, navigation style (Gide & Wu, 2006; Horsti et al., 2005; Laosethakul & Boulton, 2007; Liu & Arnett, 2000; Xu, 2005), Website attractiveness (Keh & Shieh, 2001; Liu & Arnett, 2000; Rogers, 2001), security system, speed of the site, stability (Phan, 2003; Poon & Lau, 2006; Vaithilingam, Nair, & Guru, 2013; Vijayaraman & Bhatia, 2002), and flexibility (Horsti et al., 2005; Sebora et al., 2009; Sung, 2004). These components are well discussed in the existing literature. Therefore, it is hypothesised that:

H_{C9}: *Stable, secure, and easy to use systems positively influence the EC success in Vietnamese SME.*

4.5 Data and Data Structure

4.5.1 Primary Data

In this study, the researcher used primary data on the B2C EC in Vietnamese SMEs. In the Vietnamese context, all businesses that publish Websites for shopping purposes have to report to the authorities (Degree No. 185/2013/NĐ-CP, issued on 15/11/2013). The government department that has the responsibility for manage B2C EC activities is the Ministry of Industry and Trade and its sub-division , the Vietnam E-commerce and Information Technology Agency (VECITA). Information of B2C EC SMEs is published on VECITA's Website[1]. As of October 2014, there are 3920 enterprises registered on this Website.

4.5.1.1 Sampling description

The criterion for determining SMEs is based on the definition provided by the Vietnamese Government, which is the number of full-time employees working within an enterprise: a micro-sized enterprise has 1 to 9 employees; a small-sized enterprise has 10 to 49 employees; a medium-sized enterprise has 50 to 299 employees; and a large-sized enterprise has more than 300 employees.

As the number of enterprises in each category was not known, a simple random sampling method was employed. A computer random number generator was used to select the final sample. The pilot survey questionnaire was sent out to 60 enterprises from the list that is publicly available from VECITA's Website. The target enterprises should be small

[1] (http://online.gov.vn/HomePage/PersonalWebsiteView.aspx)

or medium-sized enterprises currently engaging in B2C e-commerce. Participants were required to express their consent to participate in the survey via an online implied consent form. Accordingly, the respondents were requested to provide answers to the questions listed in the questionnaire. The outcome of the pilot study was used to determine the validity of the questions and the responses were used as a mechanism to develop the main survey questionnaire.

Following the pilot survey, the main extensive survey was conducted using the revised and pre-tested questionnaire. A total of 207 SMEs were selected for the final round of the survey. Quantitative information obtained from the questionnaires was coded and analysed using SPSS version 20.

4.5.1.2 Survey instruments

Questionnaire design

The initial structured questionnaire was developed based on the existing academic and practitioner-oriented literature. The researcher developed some of the constructs, while some were adopted or modified from the existing studies (Cata, 2003; Chong & Pervan, 2007; Sung, 2004). In some cases where a previous measure was adequate, sources were adequately cited and due credit given to the researchers. New constructs were added and compared with the previous measures to improve the explanatory power of the research model. Slight modifications of the wordings were made to reflect the B2C EC nature of the study, and any further changes to the instrument were re-tested in the pilot test to capture the context-specific nature of the questionnaire. The questionnaire contains open-ended questions that aim to explore the potential factors that influence B2C EC in the Vietnamese context. The questionnaire was pre-tested with the owner-managers of SMEs operating in Vietnam. The first section of the questionnaire gathered generic information related to the enterprise's size, number of employees, and type and nature of the business; the second section gathered data related to EC maturity; and the third section identified the most influencing factors on the enterprise's EC adoption status, which were further classified into entrepreneurial, technological, organisational, and environmental factors. The last section asked the respondents' to provide their demographic details.

A pilot test is an essential stage prior to the main survey (Sekaran, 2003). Cooper and Schindler (2006) also recommend that the minimum number of participants needed to conduct a pre-test of the questionnaire is 25. Therefore, 25 participants working in Vietnamese B2C e-commerce enterprises were recruited to participate in the pilot study.

The participants were asked to fill out the questionnaire, and were encouraged to discuss unclear or repeated questions, and to recommend additional factors, if any, from their practical perspectives. Suggested modifications of questions by the participants were incorporated by the researcher to improve the clarity of the survey instrument.

Within the survey instrument, the statements included were accompanied by a five-point Likert scale responses of 1 to 5 in order to measure the respondents' extent of agreement or disagreement with the variables in the study. The scale response of 1 was classified as 'strongly disagree' and the scale response rate of 5 was classified as 'strongly agree'. The cover letter and online survey techniques were used to increase the probability of recruitment of participants.

Since the main survey was conducted in Vietnam, a validated and certified Vietnamese version of the survey instrument, the cover letter and follow-up letters were developed and used in the survey.

Prior to the pilot study, an application was sent to the University of New England's Human Research Ethics Committee (HREC) for ethics approval. The application included a questionnaire in English, a consent form, and an information sheet for participants. Vietnamese versions of the documents were developed by the researcher so that the participants could better understand the nature and type of research questions in their native language. The translated Vietnamese version of the survey instrument, cover letter and follow-up letter were validated by two fluently speaking bilingual persons, a graduate student, and an academic with a doctoral qualification in economics. The information sheet for participants provided basic information about the study whereas the consent form declared the right of participants when participating in the survey. The ethics application was accepted on 30/10/2014 with approval number HE14-268. Copies of the certificate and survey instruments are provided in Appendices A1-A7.

Refinement of questionnaire

Sekaran (2003) stated that conducting pilot studies prior to the actual survey research is vital. According to Hutt and Speh (2001), a pilot study consisting of 10 to 50 cases is adequate for identifying the main defects in the questionnaire. Cooper and Schindler (2006) add that the pilot study aims to detect the possible weaknesses in the questionnaire constructs, if any. They also recommended that the minimum participants needed for the pre-test are 25. Therefore, a pilot study was sent to 60 enterprises and 45 completed survey responses were received. Of the completed 45 survey forms received,

only 25 were completed in full and deemed to be valid (accounting for a 42% response rate). The selection of the 60 enterprises was based on two important criteria: (1) being a small or medium-sized firm, and (2) and engaging in B2C EC activities.

The aims of the pilot study were to determine the reliability, validity, accuracy, integrity and ambiguity of the questionnaires, to find any exclusion of significant factors, and to make a decision in relation to the incorporation or elimination of factors from the questionnaire. Additionally the decision to conduct a pilot study was made in order to identify the Vietnamese respondents' perceptions towards the questionnaire and to make sure that the constructs included within the questionnaire matched the context-specificity of the research. Because of the differences in the business environment, such as socio-cultural and economic circumstances, the perceptions held by the Vietnamese respondents may vary to a greater extent in comparison to the other contexts.The participants were asked to fill out the questionnaire, and were encouraged to discuss unclear or repeated questions, as well as to recommend additional factors, if any, from their practical perspectives. Suggested modification of questions by the participants were incorporated by the researcher to improve the clarity of the survey.

Pilot test results

Within the demographic profiling section included in the questionnaire, in regard to the level of education of respondents (coding D3), many participants suggested splitting the variable 'higher education' into 'Masters' and 'doctor or higher' to align with the existing classification in the Vietnamese education system. This change was made in the revised and final questionnaire. The question with code D10 about information sources was also rephrased for better comprehension.

In regards to e-commerce capacity variables, most participants indicated that Vietnamese SMEs usually employ technology providers or tried to apply EC activities in basic forms that are compatible with existing activities. Hence, scale items to measure the extent of EC usage, from 'running in 1 year'-'in 2 years'-'in 3 years' were changed to 'running in trial'-'after trial 1-2 years'- 'after trial 2 years'. Two questions were also rewritten to convey a clear meaning to respondents. For example, the question with code EC4, and which stated, 'Our company communicates with customers through our company's Website', and was changed to 'Our company usually chats and e-mails to customers through our company's Website'. The second question with code EC6 stated, 'Our company gets feedback from customers through the company's Website', was changed

to ʻOur company usually solve complaints and receives feedback from customers through our company's Website'. Similarly, the pilot study also encountered problems with statements relating to environmental factors EnF11 and EnF22, making it difficult for respondents to understand. Therefore, these questions were modified as per respondents' suggestions.

Some questions were removed on the basis of the comments and recommendations received from participants during the pilot study. First, many cited that some statements seemed to convey similar meanings to the participants. For example, statement EF3, stated ʻOur leaders communicated widely about the vision of EC activities within our company'. EF5 stated, ʻOur leaders have a realistic view of EC investment in our company', and EF2 stated, ʻOur leaders have a clear vision on EC', and participants indicated that these statements have a similar meaning to each other. Hence, the statements EF3 and EF5 were removed to avoid further ambiguity. Similar concerns were expressed by the respondents with statements included as EF4, EF8, EF1. Second, many respondents pointed out that some statements had a part meaning coinciding with other statements. The common recommendations were to merge them and make some modifications, as suggested by the respondents. Similar concerns were expressed by the respondents with statements EF7, TF14, and OF24.

Third, many participants stated that some statements should be removed due to the inclusion of the option ʻunable to rate'. Similarly, participants indicated that some of the statements included within the questionnaire were not valid to the existing practices of Vietnamese SMEs. For example, sufficient advice (EF12) and technical support (EF15) from top managers were found to be quite strange in the management practices of Vietnamese SMEs, as cited by many participants. As a result, these statements were removed from the questionnaire. Furthermore, the inclusion of the option ʻunable to rate' was identified to be problematic, as some of the statements included seemed to be meaningful only to some key personnel, like top managers or team leaders of e-commerce projects. Therefore, these statements were also omitted from the questionnaire. The omitted statements from the main survey instrument included TF6, TF8, TF10, TF11, etc. Finally, OF36 statement ʻOur company provides high quality online customer service' was removed on the basis of the respondents' feedback that this information is too general and lacks appropriate criteria to judge. Furthermore, statements OF37 to OF40 were modified to include detailed information to assess quality of online customer services.

On the other hand, many participants also stated that various enterprises encounter problems in receiving necessary support from technology providers when adopting and implementing e-commerce projects. As a consequence, a statement coded EnF26 was changed to ‘Our company receives sufficient help from technology vendors’, and was added to the final questionnaire. All details pertaining to the changes made from the pilot study to the main survey questionnaire are presented in Appendices B1-B2.

4.5.2 Secondary Data

The secondary data aim to explore the relative importance of potential CSFs specific to the context of Vietnamese SMEs. The secondary data presented in the present study is a careful analysis of a number of studies in the existing literature from 1999 to 2015 that included the EC adoption and usage studies. The data were obtained by using the key search words ‘critical’, ‘success’, ‘factors’, ‘B2C’, ‘EC’ and other synonyms. Sources such as Summon, ProQuest, Web of Science, IEEE Xplore, and Google Scholar were used to identify appropriate research articles, and the researcher obtained 64 relevant articles by reading the titles and abstracts. Then, these articles were thoroughly re-read to identify CSFs, and the snowball sampling method was used by the researcher to identify the most important research articles. The final list comprised 43 relevant research articles that align with the research purpose of the present study. The researcher used Nvivo 10 software to identify CSFs and code CSFs with their meanings in each article; related CSFs were then compared using FreeMind software. The results and techniques followed when conducting the qualitative content analysis for the identification of various factors are presented in Chapter 5.

4.6 Summary

In this chapter, the research design and an outline of the analytical framework were presented. The outline of the method of analysis and the hypotheses relevant to this research study were also discussed. The study employs a multi-stage approach, including an exploratory analysis, a meta-analysis and a quantitative analysis. The exploratory analysis is guided by a review of the existing theoretical and empirical evidence in the literature. The content analysis framework is used to examine the content of CSFs in the existing literature and to reveal evidence obtained from the open-ended question data. A quantitative approach using descriptive statistical analysis and regression-based approaches will be used to examine the nature, patterns and relationships of key dependent and independent variables.

Based on the review of the literature, and in line with the objectives of the study, several hypotheses were proposed. These hypotheses included relevant factors related to the TOE category. Finally, data and data structure need to be examined and collected to achieve the stated research goals. The next chapter will present the collection of the secondary data, analysis of the data obtained from the open-ended questions, and analysis of the results obtained from the content analysis.

Chapter 5: A Content Analysis of CSFs and Barriers to B2C EC

5.1 Introduction

As outlined in Chapter 4, one of the methods of analyses used in this study is to conduct a qualitative meta-analysis on the arguments drawn from the existing literature. Using the content analysis, the CSFs pertaining to B2C activities were identified and critically discussed. The CSFs were summarised and classified based on frequency of occurrence in the literature. Contextual analysis of the identified CSFs was conducted. Chapter 5 is organised as follows: a brief discussion of the methods in the context of CSFs is presented in section 5.2, the process of qualitative data collection is discussed in Section 5.3, the results of the qualitative data analysis in are presented in Section 5.4, the exploratory research about CSFs and barriers to Vietnamese SMEs is presented in Section 5.5, a discussion of the qualitative results is provided in Section 5.6, and the concluding comments are presented in Section 5.7.

5.2 Overview of the Approach

This section provides an overview of the suitability of the qualitative research approach for meeting the research goals stated in the present study. In order to have an in-depth understanding and coherent meaning of the CSFs that has been identified by previous researchers in the existing research on EC adoption and diffusion, the content analysis technique was employed. This type of inductive research technique was employed due to the lack of proper classification of CSFs in B2C EC activities in the existing literature. The steps followed in conducting the qualitative literature analysis are discussed below.

The first step was to explore research articles that elicit the information on CSFs in the existing literature. In order to obtain relevant research papers, appropriate databases were identified by the researcher, and keywords were set to find appropriate articles. Keywords were chosen in this research based on keywords that were used by researchers in the most cited articles, including Borges et al. (2009); Dubelaar et al. (2005); Duffy and Dale (2002); Lei-da, Haney, Pandzik, Spigarelli, and Jesseman (2003); Sung (2004). Some keywords such as ‘critical’, ‘success’, ‘factors’, ‘B2C’, ‘EC’ and relevant synonyms were used to search the literature.

Initially, the key words identified were searched in popular databases such as Summon, ProQuest, Web of Science, IEEE Xplore, and Google Scholar. This type of data

collection is widely accepted for conducting meta-analysis in IS based research (Dezdar & Sulaiman, 2009; Parker & Castleman, 2007).

In order to achieve comprehension about CSFs in B2C EC, all of the identified articles were first downloaded, read carefully by the researcher and classified according to the purpose of the research. Second, a snowball sampling technique was employed because of the popularity associated with the existing CSF research trends. CSFs that were referred to in these research articles in the first wave of the data collection were traced back to the original sources. This process was repeated by reading and re-reading the existing material until the articles were tracked to the original sources. The researcher had the opportunity to go through as many research articles as possible from different databases and the utmost care was taken that none of the important articles were left out. This method was followed based on the procedures outlined in the well-known meta-analysis studies conducted by Park and Gretzel (2007), Beatty, Reay, Dick, and Miller (2011), and Dezdar and Sulaiman (2009). All of the information obtained was summarised and entered in the database in NVivo software for compilation and further analysis.

This study includes a deep exploration of the extant literature within the B2C EC context from 1999 to 2015. The aim of conducting the secondary data collection is to identify CSFs in B2C EC. Relevant articles during this period about CSFs in B2C EC, then, were reviewed and examined. This period was chosen due to lack of consistent information about CSFs in the existing literature.

A number of possible articles were found by proposing several keywords of relevance from the previous section. For example the database search with relevant keywords such as ʻCSFsʼ AND ʻB2Cʼ AND ʻe-commerceʼ resulted in 356 articles, 121 articles resulted from the keywords ʻB2Cʼ AND ʻe-commerceʼ AND ʻproject failureʼ, and 573 articles resulted from the keywords ʻ B2Cʼ AND ʻe-commerceʼ AND ʻrisk factors'. These results were achieved until the 24 August 2015 by the researcher. The outcomes of the search process are summarised in Table 5.1:

Table 5.1: Summary of secondary data collection*

No.	Keywords	Results				
			First stage (Titles)	Second stage (Abstract)	Third stage (Context)	Last stage (Detail)
1	ʻCSFsʼ AND ʻB2Cʼ AND ʻe-commerceʼ	356	71	91	66	43
2	ʻB2Cʼ AND ʻe-commerceʼ AND ʻproject failureʼ	121	17			
3	ʻB2Cʼ AND ʻe-commerceʼ AND ʻrisk factorsʼ	573	65			

(*Accessed completed on 24 August 2015)

Following the approach by Beatty et al. (2011), attempts to eliminate irrelevant research articles were based on reading the titles of the retrieved articles. This process resulted in the identification of 153 relevant articles. These articles were downloaded by the researcher and then printed out for further exploration of relevant research themes and categories of importance. In the second stage, these articles were read in more detail by way of reading the abstracts. This process resulted in 91 relevant articles. Following this step, research articles were further read with the criteria that fits the research context (B2C) and the scope of the research (organisational level), and referred to innovations relating to e-retailing (Websites, portal). The outcomes of this entire process resulted in 66 of the most important research articles. Accordingly, 66 papers were read in detail, and other relevant papers referring to original data sources were traced back to add to the data. The last step provided 43 papers relating to CSFs in the B2C EC context.

5.3 Data Analysis

This section describes the various steps employed to analyse the CSFs. A two-step procedure was followed to further investigate the identified CSFs. The first step aimed to generate a comprehensive report about the meaning of CSFs, and the second step consisted of some qualitative processes to analyse CSFs. In order to implement these steps, appropriate coding of CSFs was determined to be crucial, and this process is described below.

5.3.1 Coding CSFs

After obtaining sufficient data, the unit for the content analysis must be identified. The research goal is to determine the most important factors in the existing literature,

therefore, any announcement or relevant actions taken by the enterprises that helps them to conduct B2C EC successfully were chosen as a basic unit of analysis.

An in-depth examination of a total of 43 research papers was performed. This step aimed to explore CSFs for EC adoption and usage in the B2C context. All potential factors and their sub-factors were checked for further descriptions, definitions, examples, and even actions taken by successful enterprises that either illustrated, mentioned or even made reference to CSFs. These factors were coded with relevant words and sentences to provide clear a meaning of the identified factors. The researcher then used NVivo 10 software to obtain relevant outcomes.

NVivo 10 is a computer software developed by Qualitative Solutions and Research Pty. Ltd located in Melbourne, Australia. This software enables the storing identified research themes as node systems. It also helps to accelerate the process of accessing relevant data and subsequent coding in the form of reports that identify the most popular coding themes. A system of nodes was created in NVivo. Each node is considered to be a single CSF and treated independently to other nodes. These nodes, then, were coded further by identifying relevant words and sentences that describe and illustrate the actual meaning of the CSFs. For example, Figure 5.1 illustrates a screen shot of how the ʻreliabilityʼ factor was coded using the software (Sukasame, 2005). The comparison of CSFs is associated with the identification of relevant nodes. In the process of coding, the researcher arrived at some super factors that combined associated sub-factors, such as ʻservice qualityʼ from Liu and Arnett (2000), which included ʻquick responsivenessʼ, ʻassuranceʼ, ʻreliabilityʼ, ʻempathyʼ, and ʻfollow-up serviceʼ factors. Other research studies have identified these sub-factors as separate CSFs. These identified super factors were further broken down into sub-factors to understand their inherent meaning and as a preparation for performing the content analysis later. Eventually, the researcher identified 612 CSFs.

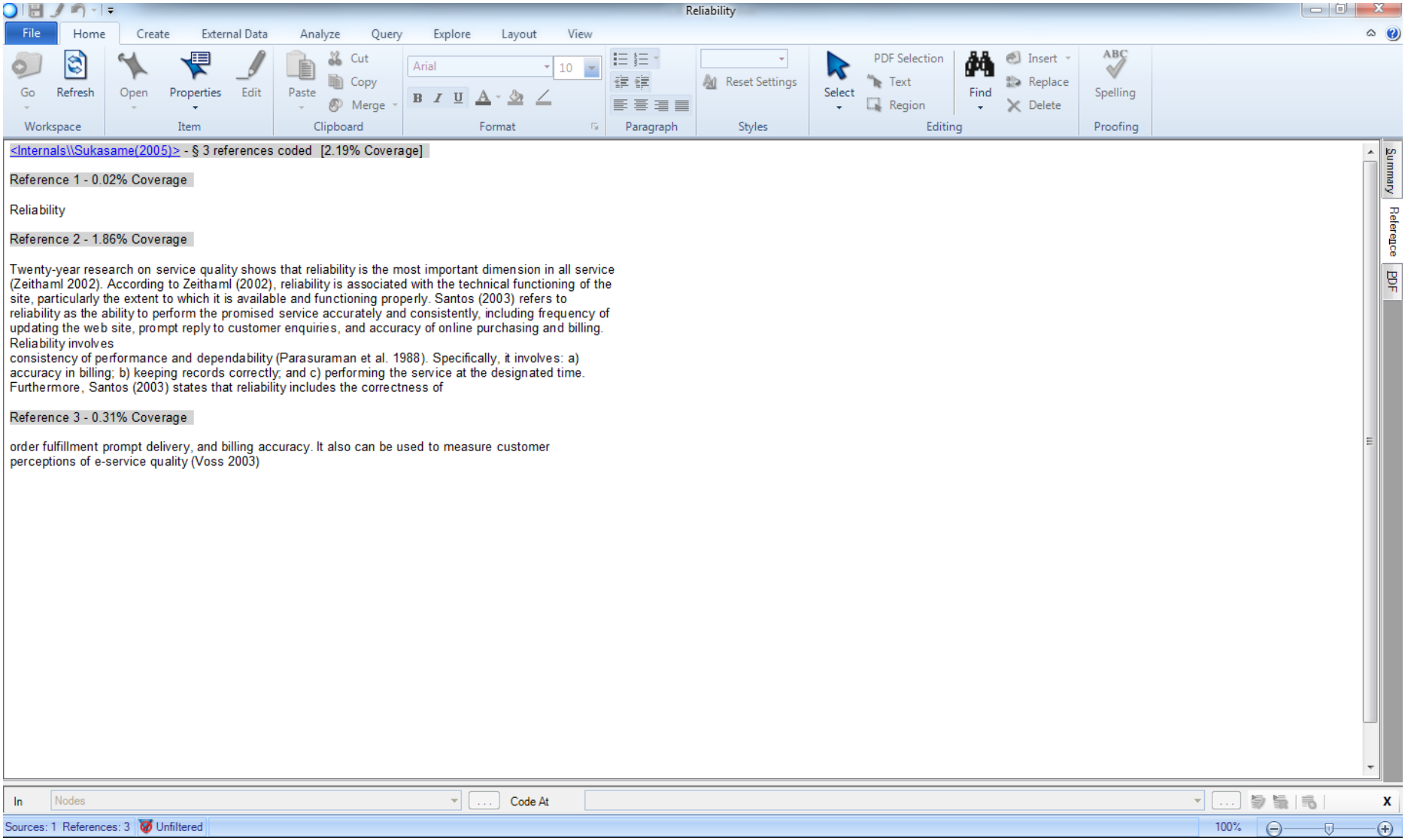


Figure 5.1: Screen shot - coding CSFs

5.3.2 Analysis of CSFs

This section presents the process of analysing the CSFs. It includes comparing factors, and identifying main themes, then assigning factors into the main themes.

The reason for the emergence of a huge number of CSFs relates to the scholarly use of different terms to describe the same factors. For example, 'choices/selection of product/services' (Laosethakul & Boulton, 2007), 'assortment' (Xu, 2005), 'product variety' (Lin & Fu, 2012), 'wide product offering' (Horsti et al., 2005) would fall under the same coding category. Moreover, some CSFs that have more than one sub-component were broken down further for analytical purposes as an attempt to provide a more meaningful discussion.

An important step for analysing CSFs is to classify the factors into different categories. The classification is based on the identified common themes defined by their intended meaning. Following Hedman and Kalling (2003), all CSFs were classified into different e-business related classifications with respect to (1) customers, (2) competition, (3) level of offering, (4) activity and organisation level, (5) resources, (6) suppliers, and (7) environment. The different categories are grouped according to:

1. Level of association of the customers;
2. Nature of competition with the enterprise market;
3. Physical components such as price, cost, and/or service components;
4. Value chain activities and organisational structures;
5. Human, physical, and organisational resources that are essential for meeting specific organisational processes;
6. Factor markets and production inputs; and
7. Environmental barriers for various actors in the business, and associated cognitive and social limitations.

The researcher created a conceptual map with seven branches that showcased the aforementioned thematic coding in order to compare the CSFs easily (the first level of the map). This task was fulfilled by the computer software FreeMind. This freely available and user-friendly software is written in Java, and licensed by GNU General Public License version 2. Also, the software enables exploration of the structure of a database that is not known in advance.

In the next stage, a report was generated by the researcher using NVivo 10 software as a source for comparison of the identified CSFs. The report is presented in four columns. The first column denotes the name of the identified CSF, the second represents the name of

the category in which the CSF fits, the third provides details of the authors of the identified research paper, and the fourth gives the relevant coded text used within the academic paper (Figure 5.2). The report was printed out to easily check the actual meaning of CSFs in the next stage of analysis.

Name	Attribute Value	Name	Coded Text
Brand name presense	1 Marketing	Duffy (2002)	For start- up dot-coms a vast amount of money is spent on advertising. One of the business processes critical to success is to enter into partnerships with established Internet brand names, to engineer visibility and Internet trustworthiness. The most cost- effective method of achieving this is by working in collaboration with the junction- box/infomediaries. When a search is performed by an individual looking for a particular product or service, the search engine promotes the sites of partners. This is more readily observed when using a bespoke search engine. When a search is requested, the answers are inevitably biased in favour of certain companies, those that either pay for this preferential treatment or pay a transaction fee for every user who enters the partner's Web site via the Web site. Another method of using partnerships to increase order generation is to use a well known brand name.
Brand name presense	1 Marketing	Duffy (2002)	While order fulfilment is considered as one of the main stumbling blocks for many of the logistics and cash-flow e-tailers, order generation is equally important to get consumers to view the Web site.
Brand name presense	1 Marketing	Duffy (2002)	Order generation

Figure 5.2: Report on Coding CSFs

The researcher carefully read through all of the CSFs included within the report. CSFs were loaded into the mind map based on the associated meanings. The first level of the map identified new branches that presented various sub-dimensions that are closely associated with the identified first order CSF (the second level of the map). In the third level of the map, some sub-branches were narrowed down to provide greater clarity of the identified CSFs. For instance, with the CSF 'control management capacities'; sub-dimensions of 'monitor internal processes', 'process improvement, cost control', 'financial control', and 'risk management' were included in the mind map as depicted in Figure 5.3.

Figure 5.3: Illustration of control management factor in the mind map

The generated mind map with seven categories was determined not to fit with this type of classification due to the nature of CSFs in B2C EC, as well as the characteristics of the secondary data. For example, some factors such as trust and customer service dominated the data generated from the academic research papers. This can be linked to the explanation that B2C EC activities relate directly to the individual customers, and the levels of trust and customer service exerted by these customers are integral to the e-commerce activities. Furthermore, classification of Hedman and Kalling (2003) is based on an e-business model in which e-business activities occur at the maturity stage of the enterprise. For example, factors related to identifying, monitoring, and running an EC project do not fall into any categories proposed by Hedman and Kalling (2003). As a result, the researcher classified the identified CSFs into four main categories: (1) product, (2) customer management, (3) environment, and (4) organisation (Figure 5.4). The product category refers to the various attributes and availability of products/services. The second category mentions an organisation's activities to attract and retain customers. The environment category alludes to factors related to external forces that impact on the business activities of an enterprise, such as government laws and policies related to EC, availability of infrastructure to conduct e-commerce, culture inside or outside the enterprises, the characteristics of the market force, and pressure from competitors. The last category refers to an organisation's activities to support innovation, leadership, organisational size, building Websites and EC systems, education and training for staff, and control management capacities.

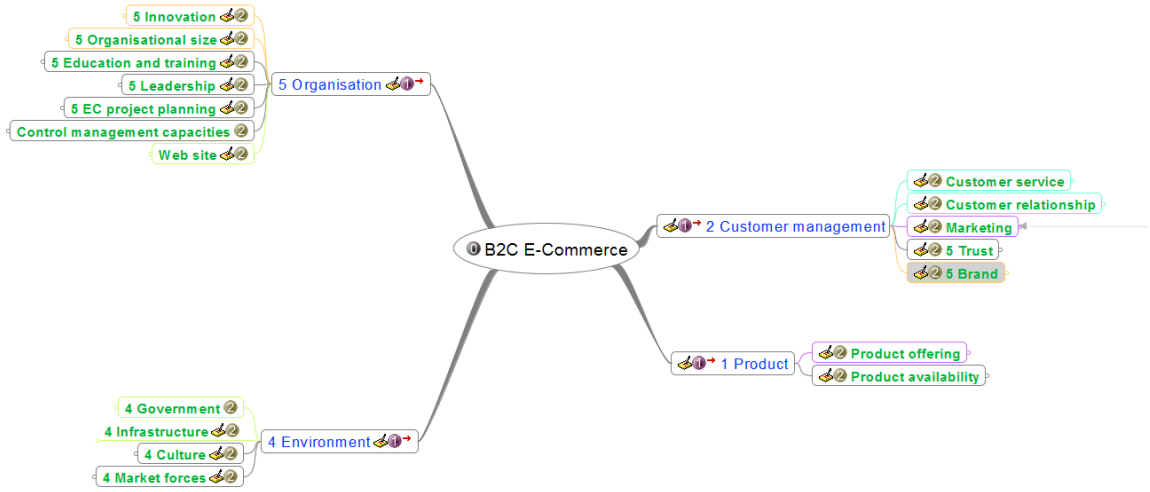


Figure 5.4: CSFs relevant to B2C EC mind map

In order to clarify the meaning of CSFs, classification of the identified CSFs in the mind map and classification of node systems in Nvivo 10 were undertaken together. For instance, CSFs were compared if they belonged to a specific category, and these CSFs were added to a branch of the map by the researcher. In contrast, if the identified CSFs did not belong to any existing branches of the map, a new branch was created that aligned with the meaning of that specific factor. Using Nvivo 10 at the same time, nodes were assigned to specific attributes through the process of ʻmappingʼ by the researcher. The mapping attributes have the same value names as the CSFs used in the FreeMind software program. Particularly, mapping attributes have the values ʻproduct availableʼ, ʻproduct offeringsʼ, ʻbrandsʼ etc. and thus acted as the main CSFs. As a result, the more the process of comparison and classification of CSFs was improved through checking the meaning of CSFs and placing them on various branches of the map in the FreeMind software program, the more the system of nodes was modified, updated, and developed in the NVivo program.

The next section will present the outcomes of the processes carried out using the NVivo 10 data analysis.

5.3.3 Results

5.3.3.1 Identification of CSFs

After comparing CSFs in the map and analysing nodes in NVivo, the researcher archived 23 CSF themes that occurred most frequently, including ʻbuilding brand imageʼ, ʻbuilding trustʼ, ʻcontrolʼ, ʻcultureʼ, ʻcustomer relationship capacities and maintainanceʼ, ʻcustomer serviceʼ, ʻEC architectureʼ, ʻEC development optionsʼ, ʻEC operations, maintenance, updatingʼ, ʻEC process managementʼ, ʻEC systemʼ, ʻeducation and trainingʼ, ʻgovernmentʼ, ʻinfrastructureʼ, ʻinnovationʼ, ʻleadershipʼ, ʻmarket forcesʼ, ʻmarketingʼ, ʻorganisational sizeʼ, ʻproduct availableʼ, ʻproduct offeringʼ, ʻproject identification, justification, planningʼ, and ʻtesting, installation and integrationʼ.

Following these themes, various sub-themes were identified on the basis of the prevailing organisational practices for conducting B2C EC business. Thus, 70 sub-themes were identified from the secondary data. For instance, the ʻleadershipʼ factor consists three sub-factors ʻleader knowledge and experienceʼ, ʻencouraging commitment of the whole companyʼ, and ʻleader participationʼ. In other words, these sub-themes were classified as critical success factors based on their relative importance to the main factors (Table 5.2 summarises 23 CSF themes and their 70 sub-CSF themes).

Table 5.2: Summary of CSFs and relevant sub-themes

CSF themes	Sub-CSF themes	Questionnaire codes
1. Product available	Plenty of information	1PA_1
	Updated information	1PA_2
	Accurate information	1PA_3
2. Product offering	Variety of products	2P_1
	Provide add-value products (provide great value)	2P_2
	Brand/quality products	2P_3
	Personalised products	2P_4
3. Building brand image	Building brand image	3BBrand_1
4. Building trust	Building customer trust	4BTrust_1
5. Customer relationship capacities and maintain	Well-managed customer's expectations through Website	5CR_1
	Connecting internal commitment to existing services	5CR_2
6. Customer service	Quick response to customers	6C_1
	Order fulfilment	6C_2
	Quality of service	6C_3
	All times service	6C_4
	Post-purchase service	6C_5
	Personalised customer service	6C_6
	Variety of payment methods	6C_7
	Added-value service	6C_8
	Assurance to solve customers' problems	6C_9
7. Marketing	The ability to market through database	7M_1
	Good advertising campaigns	7M_2
	Effective combination of online and offline marketing	7M_3
	Focus on online marketing	7M_4
8. Culture	Culture	8Culture
9. Government	Government support	9Gov
10. Infrastructure	Infrastructure	10Infrast
11. Market forces	Competitive pressure from industry	11M_1
	Managing suppliers' and partners' relationships	11M_2
	Monitoring competitor activity	11M_3
	Supplier support	11M_4
	International relations	11M_5
12. Control	Financial control	12Ctrl_1
	Price management	12Ctrl_2
13. EC architecture	Business process re-engineering	13ECA_1
	Technology needs	13ECA_2
	Compatibility	13ECA_3

Continue in next page

Table 5.2: Continued.

CSF themes	Sub-CSF themes	Questionnaire codes
14. EC development options	Prepare human resources	13ECA_4
	Incremental development process	14ECD_1
	Strategic alliances with partnerships	14ECD_2
	Rapid changes in technology	14ECD_3
15. EC operations, maintenance, updating	Building and maintaining solid EC architecture	15OM_1
	Website monitoring and adaptation	15OM_2
16. EC process management	The ability to manage business change	16PM_1
17. EC system	Ease of use	17Web_1
	Website attractiveness	17Web_2
	Secure Website and other related systems	17Web_3
	Content richness	17Web_4
	Navigation	17Web_5
	Access the Website at any time and any platform	17Web_6
	Fast speed of systems	17Web_7
	Stability of systems	17Web_8
18. Education and training	Frequent communication and knowledge sharing among team members	18ET_1
	Competencies of internal users	18ET_2
	Good e-business education and training	18ET_3
	Building knowledge management systems	18ET_4
19. Innovation	Organisational support for innovation and new technology applications	19INNO_1
	New service and product initiation	19INNO_2
20. Leadership	Leaders' knowledge and experience	20L_1
	Encouraging commitment of the whole company	20L_2
	Leadership participation	20L_3
21. Organisational size	Organisational size	21Size
22. Project identification, justification, planning	External consultants	22PIJ_1
	E-commerce strategy based on business model	22PIJ_2
	Clear goals, objectives and planning	22PIJ_3
	Clearly defined performance measures	22PIJ_4
	Dedicated resources	22PIJ_5
23. Testing, installation and integration	Trialability	23TI_1
	Fast and integrated business processes	23TI_2
	Establish a close relationship with their suppliers and customers while implementing e-commerce	23TI_3

(Source: Researcher's own compilation)

5.3.3.2 CSF frequency

The second purpose for the coding process was to identify the frequency with which the CSFs occurred in the existing secondary data. In order to fulfil this objective, all sub-themes of the identified CSFs were assigned a new attribute, ʻquestionnaire codeʼ. Following that, another attribute in Nvivo software was created and assigned to all CSFs named in this process. The value assigned for each CSF was ʻyesʼ if present in a certain article, or even if this identified CSF was referred to only once in the article. By doing this, some sub-CSFs that were mentioned in an analysed article were not coded twice. For example, the ʻinformationalʼ , ʻalternative navigationʼ, and ʻgood functionalityʼ factors in Poon and Lau's (2006) research refers to the ability of a Website that helps customers to find products easily. It means that these factors are components of an identified CSF coded as ʻgood navigationʼ. As a result, one of the three factors has a ʻcounterʼ value as ʻyesʼ. Eventually, all CSFs with the value ʻyesʼ were counted to generate the frequency of CSFs in the data (Table 5.3 shows the top 53 sub-CSFs referred to by various authors in the existing literature).

The content analysis revealed that the top important factors identified were ʻbuilding an e-commerce model based on the business modelʼ and ʻease of using Websiteʼ, which referred to by 39.5% of the extant EC research articles. Approximately 34.9% of the studies included in the secondary data cited ʻbuilding trustʼ and ʻencouraging commitmentʼ in the enterprise as the key factors guaranteeing success in the adoption of a B2C venture. There are 32.6% of researchers who cited ʻquick response to customersʼ, ʻability to deal with business changeʼ, and ʻinsurance for security of EC systemʼ as vital factors for implementing B2C e-commerce. This could be due to the nature of B2C EC business, in which good management of an EC project, adequate Website system, and appropriate customer services guarantee success in online business activities for enterprises. Interestingly, some factors related to customer service such as ʻassurances to solve customer's problemsʼ, ʻadd-value servicesʼ, ʻall times serviceʼ, and ʻproviding personalised productsʼ were found to be less important in conducting successful B2C EC, accounting for only 9.3% of comments from existing researchers. As most of these studies have been conducted in developed countries, it is likely that these factors are not part of competitive strategies in online business because these factors are well-experienced in enterprises in these countries.

Table 5.3: Emergence of CSF sub-themes frequency

Sub-CSFs	Questionnaire codes	CSFs	N	Frequency
E-commerce strategy based on business model	22PIJ_2	22 Project planning	17	39.5%
Ease of use	17Web_1	17 EC system	17	39.5%
Building customer trust	4BTrust_1	4 Building trust	15	34.9%
Encouraging commitment of the whole company	20L_2	20 Leadership	15	34.9%
Quick response to customers	6C_1	6 Customer service	14	32.6%
The ability to manage business change	16PM_1	16 Manage change	14	32.6%
The ability to manage business change	16PM_1	16 EC process management	14	32.6%
Secure Website and other related systems	17Web_3	17 EC system	14	32.6%
Building brand image	3BBrand_1	3 Brand	13	30.2%
Flexible system for rapid change in technology	14ECD_3	14 EC development options	13	30.2%
Website attractive	17Web_2	17 EC system	13	30.2%
The ability of managing the customer relationship	5CR_1	5 Customer relationship	12	27.9%
Fast and integrated business processes	23TI_2	23 Testing	11	25.6%
Order fulfilment	6C_2	6 Customer service	11	25.6%
Good content about products/services	17Web_4	17 EC system	11	25.6%
Variety of products	2P_1	2 Product offering	10	23.3%
Fast system	17Web_7	17 EC system	10	23.3%
Incremental development process	14ECD_1	14 EC development options	10	23.3%
Financial control	12Ctrl_1	12 Control	10	23.3%
Provide good education and training to employees	18ET_3	18 Education and training	10	23.3%
Business process re-engineering	13ECA_1	13 EC architecture	9	20.9%
Identifying technology needs	13ECA_2	13 EC architecture	9	20.9%
Providing high quality of services	6C_3	6 Customer service	8	18.6%
The ability to market through database	7M_1	7 Marketing	8	18.6%
Continuous innovation	19INNO_1	19 Innovation	8	18.6%
Frequent communication and knowledge sharing among team members.	18ET_1	18 Education and training	8	18.6%

Continued in next page

Table 5.3: Continued.

Sub-CSFs	Questionnaire codes	CSFs	N	Frequency
Strategic alliances with partnership while implementing EC	14ECD_2	14 EC development options	8	18.6%
Clear goals, objectives and planning	22PIJ_3	22 Project planning	7	16.3%
Good navigation	17Web_5	17 EC system	7	16.3%
Competencies of internal employees	18ET_2	18 Education and training	7	16.3%
Clearly defined performance measures	22PIJ_4	22 Project planning	6	14.0%
Leaders knowledge and experience	20L_1	20 Leadership	6	14.0%
Plenty of information about products	1PA_1	1 Product available	6	14.0%
Provide add-value products	2P_2	2 Product offering	6	14.0%
Well-prepared HR for EC implementation	13ECA_4	13 EC architecture	6	14.0%
Price management	12Ctrl_2	12 Control	6	14.0%
Company culture	8Culture	8 Culture	6	14.0%
Secured time and finance for EC implementation	22PIJ_5	22 Project planning	6	14.0%
Updated information about products	1PA_2	1 Product available	5	11.6%
Provide brand/quality product	2P_3	2 Product offering	5	11.6%
Focus on online marketing	7M_4	7 Marketing	5	11.6%
Stability of systems	17Web_8	17 EC system	5	11.6%
Access the Website at any time and any platform	17Web_6	17 EC system	5	11.6%
Competitive pressure from industry	11M_1	11 Market forces	5	11.6%
Governmental support	9Gov	9 Government	5	11.6%
Assurances to solve customer's problems	6C_9	6 Customer service	4	9.3%
Add-value services	6C_8	6 Customer service	4	9.3%
All times service	6C_4	6 Customer service	4	9.3%
Providing personalised products	2P_4	2 Product offering	4	9.3%
Effective combination of online and offline marketing	7M_3	7 Marketing	4	9.3%
Efficient performance management	15OM_2	15 EC operations	4	9.3%
Monitoring competitors' activities	11M_3	11 Market forces	4	9.3%
Organisational size	21Size	21 Organisational size	4	9.3%

(Source: Researcher's own compilation)

5.3.3.3 Results on different research approaches

Scholars typically tend to use three research methods: qualitative, empirical/quantitative, and analysis of the existing literature. Existing qualitative studies in B2C EC research mainly focused on exploring CSFs within the successful enterprises by using a case study type of methodology (Feindt et al., 2002; Keh & Shieh, 2001; Viehland, 2000), by focusing on analysing the failure and success of e-retailers (Mahajan, Srinivasan, & Wind, 2002), or by gathering the perceptions of consultants (Duffy & Dale, 2002). In the context of the empirical studies, researchers considered the structure of CSFs and identified factors relating to the importance of CSFs in conducting EC activities (Esichaikul & Chavananon, 2001; Zhu, Ho, et al., 2003). Another approach that is commonly used in the existing research is examining relationships between potential CSFs as independent variables, and the beneficial results of EC activities as dependent variables. Measurement of EC outcomes in the existing literature has focused on checking the validity of the identified variables (Madeja & Schoder, 2002), or measuring the tangible values archived from EC activities such as return on assets (ROA), and/or statistics from the Webmaster where these Website are hosting or located. A majority of the researchers have analysed the existing literature by identifying potential CSFs that might have a profound impact on EC adoption and usage in the B2C context (Deželak et al., 2006; Sukasame, 2005; Vijayaraman & Bhatia, 2002).

On the other hand, although these three methods has been used in the existing literature, the merit of conducting meta-analysis for the identification of the CSFs in the adoption of EC in the B2C context have been totally ignored or have attracted limited attention from the researchers. Therefore, this study attempts to fill this identified gap and identifies the potential CSFs relevant to B2C EC adoption in SMEs through meta-analysis.

5.3.3.4 Results on different research contexts

With respect to the research context, factors that influence level of IT/IS usage, as well as benefits, vary due to the characteristics of the research study context. In a study conducted by Zhu and Kraemer (2005) on e-business usage and benefits in the retail industry, it was identified that international scope and competitive pressure have a strong impact on e-business usage in enterprises in developed countries, while these factors do not influence e-business maturity in enterprises in developing countries. Sung (2004) examined CSFs across three countries, Korea, Japan, and USA, and noted that the CSFs of e-commerce activities are related to operating a business smoothly and efficiently in lower

EC development countries like Korea and Japan. In contrast, enterprises in the USA focus on factors that solve obstacles relating to ethics and laws. Sung (2004) also suggested that differences in the existing culture in these countries are leading to different perceptions in terms of the adoption and implementation of B2C EC activities in enterprises.

Although researchers have identified CSFs in various study contexts, a vast majority of the studies have been conducted in developed countries. Specifically, this research identified 24 research studies conducted in developed countries, of which 12 studies related to the USA , and seven to EU and other developed countries. There are only 10 studies that were conducted in developing countries, with six being conducted in Taiwan and China, and two in the context of Thailand. The following section will present the results of the content analysis of the two open-ended questions included in the main questionnaire.

5.4 CSFs and Barriers in the Vietnamese Context

Using the open-ended questions included in the pilot study and the main survey, the perceived CSFs and barriers in the context of Vietnamese SMEs were analysed.

In the pilot study, there were 25 valid responds, in which 18 participants provided answers about CSFs to the questions included, and 16 participants provided responses to questions related to EC barriers. In the main survey, 50 valid responses were obtained from participants for the open-ended questions included in the questionnaire. Approximately 45 participants responded to the open-ended question on CSFs related to EC, and 44 participants provided their views on the open-ended question related to EC barriers. The data for open-ended questions consisted of 63 responses for EC CSFs and 60 responses for EC barriers.

The main reason for including open-ended questions in the questionnaire was to explore potential barriers and to identify the most critical factors in EC adoption in participants' own words, due to context specificity and lack of sufficient literature relative to the Vietnamese SME context. All of the responses from participants were transferred to a document for easy reference and then were read and re-read by the researcher to make sense of the responses obtained. The responses from participants were categorised based on the conceptual coherence of words, sentences, and short paragraphs. The content included within the categorised words, sentences and paragraphs was carefully interpreted for relevant themes for the identification of significant barriers and CSFs that are consistent with the literature review. This exploration process, however, did not lead to any new factors that would deviate from the existing research.

The content analysis was employed to classify the factors. The theoretical evidence revealed that the analysis consists of two techniques (Elo & Kyngäs, 2008). The first one includes inductive content analysis, where there are no previous studies to support the current study. The second is the deductive technique, which is used where there seems to be sufficient evidence from previous studies but in different research contexts or time periods. The results from the above sections show that B2C EC activities can be categorised into some the themes of technological, organisational, environmental, and product-related aspects, which can be further followed by relevant sub-themes. These identified sub-themes are presented below:

1. **Market characteristics**: This theme is related to characteristics of customers, traditional business practices, partners or competitors specific to the Vietnamese small and medium-sized business environment.
2. **Government roles**: This theme applies the law and various legal enforcements, and the available support from the government for Vietnamese SMEs.
3. **Management capacities**: This theme is associated with prevalent management practices in enterprises, leadership, knowledge and the experience of top managers specific to the Vietnamese business context.
4. **Organisational activities related to customers:** This theme relates to organisational activities aimed at attracting customers, supporting customers in the electronic transaction processes, and other activities by Vietnamese businesses targeted towards building up the relationship with existing and potential customers.
5. **Resources**: This theme refers to the existing human, financial, and EC infrastructure in Vietnamese enterprises.
6. **Product offerings:** This theme refers to the value and characteristics of product offerings of Vietnamese small and medium-sized enterprises to attract customers.

Therefore, in this study, a deductive technique was used to reveal the main trends in which respondents identified CSFs that are much needed in order to achieve the real benefits of conducting EC business activities in Vietnamese small and medium-sized enterprises.

5.4.1 Responses to Open-ended Question Relating to EC Barriers

The first open-ended question asked participants to identify the main barriers that prevented their enterprises from adopting/using EC activities. Table 5.4 presents a

summary of the key identified barriers based on content analysis. The content analysis of the responses disclosed that most of the comments related to obstacles coming from SMEs' business environment (accounting for 46.9%). Of the environmental factors, market characteristics were seen to be the most limiting factor, followed by the government role. Approximately 31% of responses related to activities within participants' organisations, in particular pertaining to resources. About 19% of the barriers were attributed to technological requirements. Some examples and verbatim quotes from respondents relating to the top four most frequent sub-categories are presented below.

Table 5.4: Open-ended question coding results for barriers

Factor themes	**Frequency**	**%**
Number of coding text	**98**	
A. Technology requirements	**19**	19.4%
Cost of EC	7	7.1%
Payment	5	5.1%
Security	2	2.0%
Technology available	3	3.1%
B. Organisational activities	**30**	30.6%
Management capacity	9	9.2%
Resources	20	20.4%
To customers	1	1.0%
C. Environmental factors	**46**	46.9%
Government roles	10	10.2%
Infrastructure	3	3.1%
Market characteristics	30	30.6%
D. Product offering	3	3.1%

1. **Market characteristics:** Most participants rated 'lack of trust of customers towards online transactions', 'ambiguous online customer behaviour', and 'lack of appropriate mechanisms to check for quality of products/services online' as significant barriers that might profoundly influence the EC market in Vietnam, as evident in the following verbatim comments.

   Customers have negative views of e-commerce, many still have an aversion to this kind of business, lack of trust in product quality or something called 'the Internet'. Respondent# 4

   Vietnamese customers have a shopping culture in which they can see and touch products/services when they buy. Respondent# 28

2. **Resource:** Approximately 20.4% of comments from respondents reported that the main reason for not adopting B2C EC is due to ʻlack of quality staff'. The following verbatim comments are representative of the identified theme.

   Because we have a little staff so we just give these activities to be included in the future plan. Respondent# 17

   It is so difficult to find suitable staff. Respondent# 4

3. **Government role**: : Law enforcement was seen to be a significant barrier to SMEs adopting B2C EC activities, as evident in the following verbatim comments provided by the participants:

   My company sells dietary supplement and medicine, the authorities always paying strong attention on every minor errors of words and sentences (when we apply for a public procedure). Respondent# 2

   The existing law system has many ineffective rules. Respondent# 36

4. **Management capacities:** Most respondents reported that ʻtop leaders lack experience in creating effective management practices', and ʻleaders' lack of sufficient knowledge about EC activities' significantly hinder Vietnamese SMEs' EC activities, as evident in the following verbatim comments:

   My top managers do not have any experience and deep knowledge of EC yet. Respondent# 5

   The existing obstacles in management models and enterprise policies. Respondent# 60

5.4.2 Responses to Open-ended Question Relating to EC CSFs

The participants were also asked to reveal the most important factors that helped their enterprise to register success with the EC initiatives. The results of the content analysis are shown in Table 5.5. It can be seen in the table that the most important factors relate to organisational activities theme, accounting for 52%. The second most important thematic category identified relates to environmental aspects, with 25.2% of comments.

Table 5.5: Open-ended question coding results for CSFs

Factor themes	Frequency	%
Number of coding text	**123**	
A. Technology requirements	**17**	13.8%
Cost of EC	1	0.8%
Payment	3	2.4%
Security	3	2.4%
Technology available	2	1.6%
Technology changes	6	4.9%
B. Organisational activities	**64**	52.0%
Collaboration in organisations	2	1.6%
Management capacity	19	15.4%
Resource	21	17.1%
To customers	22	17.9%
C. Environment factors	**31**	25.2%
Government roles	15	12.2%
Infrastructure	6	4.9%
Market characteristics	6	4.9%
Media	2	1.6%
D. Product offering	11	8.9%

The following section will present some verbatim comments made by the respondents that align with EC related CSFs.

1. **Organisational activities to customers**: Almost all respondents rated ‘convenience in payment and delivery associated with EC services’ to be the most promising factor for conducting EC activities, as evident in the following comments:

   More convenient delivery services. For example, there are two million white collar staff, so they cannot take goods in working time. Therefore, delivery times should be in the evening or the suitable time the customers choose. Respondent# 59

   The second most frequently cited theme relates to advertising campaigns and marketing techniques.

   Focus on building the company image and mining effectively the potential customer data. Respondent# 2

2. **Resources:** Almost all respondents cited that ‘availability of skilled staff’ is critical for implementing EC activities in their enterprises, as evident in the verbatim comments.

The experience of IT staff to business activities. Respondent# 15

The knowledge of staff about EC and finding an employee with high skills and knowledge of EC at the same time is a great competitive advantage. Respondent# 45

3. **Management capacity:** A majority of the participants commented on ʻa good strategy plan to allocate resources effectively within enterprisesʼ as a key factor for conducting EC successfully.

   An effective investment strategy. Respondent# 15

   Having a clear vision and suitable human resources to employ right directions of EC plan. Respondent# 3

4. **The government roles:** Respondents cited that ʻimproving law enforcementʼ and ʻproviding policies or plans to support EC adoptionʼ are very important factors.

   Improve the public procedure processes. As a result, enterprises do not stay in long queue and waste their time to submit invoices, and there is no situation where enterprises have to go back and forward to receive certifications, supporting documents ... in various authority organisations (to get the authority permission approval). Respondent# 13

   Provide effective incentive policies about EC activities. Respondent# 64

5. **Product offerings:** Most of the comments from participants were related to the characteristics of products in an attempt to provide the best value to customers in terms of good price, or innovative tailored products in terms of the enterprise's EC activities, as evident in the following verbatim comments.

   Tailored products. Respondent# 35

   Provide unique products to market. Respondent# 15

5.5 Discussion

The results obtained from the secondary data analysis provide some theoretical evidence relevant to the identification of potential CSFs in the existing literature. The results of the content analysis revealed that most CSFs about B2C EC activities in the existing literature were related to good EC project planning, techniques to attract and retain customers, and a coherent EC system to support electronic purchase processes for customers. This might be aligned with the nature of B2C EC, where satisfying customers'

needs and keeping them loyal play a critical role in generating benefits for the enterprises (Pressey & Mathews, 2000).

However, these CSFs might not be the same in the existing literature due to the prevailing differences in research study contexts. It is evident that replicating ICT application plans from developed countries leads to the failures of the projects in developing countries (Al-Mashari & Zairi, 2000; Sung, 2004). Therefore, the context of the research may have an impact on the success of EC ventures. An exploratory study is needed to take into account the criticality of relevant factors that actually help in the adoption and usage of EC within B2C contexts.

In regard to the Vietnamese context, the CSFs suggested by the respondents were dominated by the current organisational practices. These factors relate to the ability to attract and retain customers, to have the appropriate resources, to strengthen the resource deployment and to change the management practices. This finding is consistent with the evidence gathered from the CSF related discussion in the existing literature. However, the content analysis shows that relevant support from government plays a critical role in boosting the EC implementation process in SMEs by improving the legal framework and strengthening the policies for development of EC. Thus, SMEs need further help from outside the enterprises in the form of government support.

The results obtained from the qualitative data analysis also confirm the preceding explanation. For example, the content analysis reveals that the most common barriers emerged when Vietnamese SMEs employed EC activities to fit existing business environment. For instance, the characteristics of the market pose big problems for implementing a B2C EC venture, and the lack of an appropriate legal framework also prevents these enterprises from using EC in their day-to-day business activities. In regard to internal forces within enterprises, participants noted that Vietnamese SMEs do not have enough skilled staff for adopting and conducting EC-based business activities.

Although the findings from the content analysis provide information on some barriers and CSFs that are crucial to Vietnamese SMEs in the adoption of EC activities, it is undeniable that these SMEs still encounter with certain type of limitations. First, the findings obtained are based only on a small sample's responses to the open-ended questions provided in the main questionnaire of only a small sample and therefore may not be representative of the whole population. Furthermore, certain aspects remain unanswered, such as how various SMEs deal with these obstacles and to what extent the activities related to CSFs were employed in these enterprises. In addition, the CSFs suggested by the

participants relate to portray a sort of ‘idealistic situation’ envisioned by participants. Therefore, the quantitative study in Chapter 6 will examine these factors and explore other factors on a larger scope, via survey, using appropriate statistical measures and analysis.

5.6 Summary

This chapter has presented the results obtained from the meta-analysis and the process of conducting a secondary data analysis, and the content analysis of two open-ended questions included in the pilot study and in the main survey. The content analysis was applied to disclose information about CSFs in the existing literature. In order to identify the CSFs, the qualitative research method of identifying relevant nodes, codes and categories using Nvivo 10 was discussed, where nodes were treated as CSFs. The process of conducting the meta-analysis was described. The resulting outcomes of the meta-analysis were presented in the form of potential CSFs from EC adoption and diffusion studies in the existing literature. Relevant information, including research contexts, research methods, various factors and sub-dimensions were outlined in detail.

Following this research, the content analysis was used to explore potential barriers and CSFs in the Vietnamese context. The outcomes from the previous qualitative secondary data analysis were used to identify the classification of various thematic categories. Finally, all results from the content analysis in the existing literature and the Vietnamese context were compared to explore the existence of similarities and/or differences between various research contexts in the adoption of EC activities by SMEs.

The results of the foregoing analyses indicate that major CSFs in the adoption of B2C EC are ‘building an e-commerce model based on the business model’, ‘ease of using Website’, ‘building trust’, ‘encouraging commitment of the whole company’, ‘quick response to customers’, ‘ability to deal with business change’, and ‘assurance for security of EC system’. In similar fashion, the content analysis reveals that ‘providing good customer services’, ‘having highly skilled and experienced staff’, ‘good management practices’, and ‘support from government’ are key factors for guaranteeing the success of conducting B2C EC in Vietnam. In constrast, ‘market charateristics’, ‘lack of adequate resources’, ‘government role’, and ‘management capacity’ are barriers to Vietnamese enterprises when running an Internet business.

The next chapter will present the quantitative analysis of the survey data, and the existing patterns of EC adoption in Vietnamese SMEs, factors influencing EC adoption in Vietnamese SMEs, and CSFs relevant to Vietnamese context will be examined in detail.

Chapter 6: Factors Affecting Performance of Small Business in Vietnam: Evidence Using Quantitative Survey Data

6.1 Introduction

Following the results of the qualitative analysis presented in Chapter 5, this chapter aims to present and discuss the results obtained from the survey data. The main purpose of this chapter is to provide empirical evidence of the factors pertaining to the critical success and barriers affecting the performance of small and medium-sized businesses in Vietnam. Of particular interest is providing a indication of the extent of EC activities. The chapter is organised into three key sections: a description of the survey and survey data, empirical analysis using the concept of exploratory factor analysis (EFA) and hypothesis testing procedures. The chapter ends with a brief summary.

6.2 Survey Design

The preliminary results obtained using the pilot survey that were presented and discussed in Chapter 5 provide the backdrop for conducting the detailed survey. Using the initial results, the survey instrument was calibrated, modified and finalised before the actual implementation of the survey. The finalised questionnaire was translated and validated in the local Vietnamese language to facilitate the survey process. Copies of the English and Vietnamese versions of the questionnaires are presented in Appendices A4 and A7, respectively.

As mentioned in Chapter 4, SMEs conducting B2C EC in Vietnam have to register with the Vietnam E-commerce and Information Technology Agency (VECITA). The information and addresses are made publicly available on VECITA's Website. This list served as the sampling frame from which sample respondents were randomly selected for the survey. There are a total of 3920 enterprises listed on the VECITA Website. Of these, 420 were selected and were sent copies of the questionnaire. Approximately 212 questionnaires were returned, of which five were considered invalid. Hence, the total sample consisted of 207 valid questionnaires, representing a 49.3% response rate. According to Baruch (1999) this response rate in academic research falls within the normal range of response rates when the population consists of managers and and/or professional staff (from 40% to 80%). All questions were coded and entered in SPSS version 20. The following section presents a description of data set.

6.3 Description of the Survey Data

In this section, the basic information regarding the characteristics and profile of the enterprises and survey respondents is summarised. This summary of data will provide a backdrop for the empirical analysis presented in Section 6.5.

6.3.1 Profile of SMEs

The profile of the sample SMEs in Vietnam is presented in Table 6.1. The main products and services associated with the sample SMEs selected in Vietnam include the sales of apparel, electronic devices, food, music and video games, tickets to services such as those related to travel and tours, health and well-being, and specialist services such as consulting and training. Almost one third of the respondents (33.3%) are engaged in services and sales pertaining to electronics and/or electrical devices. Approximately 22% are engaged in specialist services, including training and consultancy services. Twenty per cent are engaged in apparel, including clothes, shoes and beauty products (20.3%). Other services and products provided by the sampled enterprises range from travel and tour-related activities to food items. One of the main features of the products and services rendered by these enterprises are those that can be provided without having physical contact with the providers, thus not requiring immediate quality checks at the onset of the provision of the products and services.

Approximately 204 respondents reported the legal status of their business. Of these, 41.2% are joint stock enterprises (Table 6.1), while about 27% represented both private and proprietary limited companies. The dominant types of SME ownership displayed in this study are quite similar to a 2012 report from the Vietnamese government about enterprises conducting EC business in which the report revealed 51% were proprietary limited enterprises, and 35% and 8% were joint stock and private companies, respectively (VECITA, 2012).

Firm size can be determined using different criteria of asset holdings, capital, and the number of employees. Following the World Bank's (2007) report, the number of employees is used as a key indicator to determine the size of the enterprise. This criterion is also used officially by the Vietnamese Government (Decree no 56/2009/NĐ-CP issued on 30/6/2009). Ideally, the capital or asset holdings could have been used, but the data pertaining to these variables are not publicly available.

Hence, the sizes of Vietnamese enterprises are presented in Table 6.1. More than one third of enterprises (34.3%) employ less than 10 employees, and approximately 47% of

the SMEs in Vietnam employ between 10 and 49 employees. About 18% of surveyed enterprises employ more than 50 employees.

Table 6.1: Profile of the sampled SMEs in Vietnam

Item/Characteristics	Frequency	%
No. of observations	207	
Products and Services		
Clothes, shoes, and beauty products	42	20.3
Electronic devices	69	33.3
Home appliances	6	2.9
Flight tickets	18	8.7
Food	15	7.2
Books and office equipment	3	1.4
Movies and music concert tickets	12	5.8
Hotel/tour orders	6	2.9
Music/video/game	3	1.4
Spa services	9	4.3
Specialist services (training, consulting etc.)	45	21.7
Others*	60	29.0
Ownership		
Private	56	27.4
Joint stock	84	41.2
Proprietary limited	55	27.0
Others	9	4.4
Firm Size (Number of employees)		
1—9 employees	71	34.3
10—49 employees	98	47.3
50—299 employees	38	18.4
Firm Age (Years of operation)		
Less than 5 years	142	68.6
5—10 years	53	25.6
11—15 years	12	5.8

*includes advertising services, construction facilities, insurance services, etc.

In a study by Rand and Tarp (2012) about the business activities of Vietnamese SMEs, the researchers found that the number of years of doing business impacts on enterprises' performances. Therefore, this information is used as an important indicator of B2C EC activities. Most enterprises in this research are in a relatively early stage of operation, with 68.6% of businesses operating for no more than five years. Almost a quarter of the businesses (25.6 %) have been operating between five to ten years, and nearly 6% of the enterprises has been doing business for up to 15 years. The results confirm that most of

the enterprises are in the early stage of operation as a result of the e-commerce revolution in Vietnam, as outlined in Chapter 3.

6.3.2 Respondent Profile

Each questionnaire was completed by a representative from the sampled enterprises. The decision on who completed the survey form was decided within the company. The profile of respondents is summarised and presented in Table 6.2. Of the total respondents, about 11% were in senior management, including directors, general managers and CEOs. The majority of the respondents (28.5%) were those that are engaged in the operation of IT within the company. About 22% of the surveys were completed by casual staff and 9% were completed by administrators. Approximately 30% were completed by staff in various capacities, such as selling process supervisors, customer assistants, marketing staff, personnel staff, etc. Most of the respondents (73.9 %) were male. The high proportion of male respondents is consistent with a survey conducted by Huynh et al. (2012).

Respondents from the survey were relatively young. Over one half of participants (51.7%) were the 22 to 25 age bracket, and 20.8% of the sample had an age ranging between 26 and 30. The percentage distributions for other categories were 15%, 11.6%, and 1%, representing the age ranges from 31 to 40, 18 to 21, and 51 to 60, respectively.

Educational attainment is perceived to be an important factor with regard to the uptake and dissemination of information. Almost 88% of respondents had bachelor degrees and 11% had postgraduate training. A small proportion of respondents had completed vocational training courses only (accounting for 1.4%).

Theoretical evidence (Rogers, 2003) and empirical evidence (Rand & Tarp, 2012) from the extant literature have proven that the ability of SMEs to create social networks has a strong impact on enterprises' innovativeness. Hence, networks-related information was obtained in this survey. Table 6.3 shows that most of the information that SMEs use and supply for adoption and implementation stages comes from technology suppliers (43.0%), followed by professional bodies (30.4%), trade and industry associations (21.7%), and universities or colleges (20.3%).

Table 6.2: Profile of survey respondents

Item/Characteristics	Frequency	%
Number of respondents	**207**	
Position of respondent in the company		
Director	5	2.4
General Manager	9	4.3
Executive	9	4.3
IT staff	59	28.5
Trainee	46	22.2
Administrator	18	8.7
Other*	61	29.5
Gender of respondent		
Male	153	73.9
Female	54	26.1
Age of respondent		
18—21	24	11.6
22—25	107	51.7
26—30	43	20.8
31—40	31	15.0
51—60	2	1.0
Educational status		
Vocational school	3	1.4
University and college	182	87.9
Masters degree	22	10.6
Income of respondent		
Less than 4 million VND	65	31.4
4—6 million VND	17	8.2
6—10 million VND	66	31.9
More than 10 million VND	59	28.5

*includes selling process supervisors, customer assistants, marketing staff, personnel staff, etc.

Table 6.3: Communication channels to apply EC

Items	Frequency	%
Technology suppliers	89	43.0
Professional bodies	63	30.4
Trade & industry associations	45	21.7
Government depts. or agencies	44	21.3
Universities or college	42	20.3
Personal contacts	36	17.4
Financial institutions, banks	36	17.4
Small business advisory centres	33	15.9
Consultants	32	15.5
Research organisations	30	14.5
Public libraries	11	5.3
Internet	4	1.9

6.3 Data Screening

Prior to employing statistical procedures, data preparation for analysis is very important. All variables were first coded and entered into Statistical Package for Social Sciences (SPSS) software. Data were cleaned and checked thoroughly for missing values, outliers and inconsistency of responses. Accordingly, various statistical tests were conducted in order to check the validity and accuracy of data for appropriate statistical analysis. These processes are briefly discussed in the sub-sections below.

6.3.1 Coding Variables for Analysis Preparation

All categorical variables were coded. A complete list of the coding guide is presented in Appendix B1.The codes used for key variables are presented in the table below.

6.3.2 Missing Values

Missing values were taken into account before the data were summarised and analysed. Responses that participants rated as ‘unable to rate’ and leaving blank options were treated as missing values. All missing values were scanned and summarised. The highest missing value occurred in the variable ‘the level of logistics development’ (EnF22) (accounting for 7.2% of the survey sample). This portion of missing data was less than 15%. According to Hair’s (2010) suggestion, variables with missing values were excluded from the data analysis. Accordingly, the number of observations with no missing data were also checked for the requirements of any statistical procedures (Hair, 2010).

Table 6.4: Variable coding

Variables and coding names	Categories	Codes
E-commerce capacities	Never have a plan	0
From EC1 to EC13	Have a plan in near future	1
	Running in trial	2
	Running after trial 1—2 years	3
	Running after trial 2 years	4
E-commerce benefits	Unable to rate	0
From B1 to B12	Strongly disagree	1
Entrepreneurial factors	Disagree	2
From EF1 to TF32	Neither agree nor disagree	3
Technological factors	Agree	4
From TF1 to EF14	Strongly agree	5
Organisational factors		
From OF1 to TF44		
Environmental factors		
From EnF1 to EnF26		
Invert factors	Unable to rate	0
TF5, TF20	Strong disagree	5
OF22	Disagree	4
EnF10, EnF11, EnF16, EnF17	Neither Agree Nor Disagree	3
EnF18, EnF20, EnF22	Agree	2
	Strongly Agree	1

6.3.3 Normal Distribution Assumptions

The normal distribution assumption is required in many statistical procedures. Most of the analyses use one way ANOVA, thus it is important to check for the validity of this assumption to guarantee analytical inferences. From the theoretical evidence, this assumption has a small impact on the results of a one way ANOVA based on a F-test, unless the sample size is quite small and sample distributions are extremely different from normal distributions (Myers & Well, 2003). In order to solve this problem, an adequate sample is needed. Tabachnick and Fidell (2013, p. 114) stated that in a large size sample, the impacts of skewness and kurtosis are diminished in the results of variance of analysis. Namely, a positive kurtosis does not impact on the inferences when the sample size is more than 100, and a negative kurtosis does not impact on the inferences when the sample size is more than 200 (Waternaux, 1976). Non-parametric tests like the Kruskal-Wallis H and the Rank-Transform F-tests are also able to be use when the assumption is violated.

Equality of variance is another condition in the ANOVA procedure. In order to minimise the impact of the violating assumption on the results of ANOVA tests, data transformation helps to reduce heterogeneity variance. Some mathematical functions, such

as logarithms and square roots, can be used to transfer the original variables. Another option is to use non-parametric tests, such as the Welch and Brown-Forsythe tests, if the equality of variances assumption is violated.

The statistical procedures for the survey data were assessed according to the criteria above. First, the sample size of this survey is 207, therefore the likelihood of normal distribution being violated is minimal. All variables were checked for normal distribution and equality of variance assumptions. Non-parametric tests were employed to re-check the variables violating these assumptions. Therefore, it can be assumed that all statistical analyses techniques performed in this research are valid.

6.3.4 Assumptions of Principal Component Analysis

Principal Component Analysis (PCA) aims to (1) reduce a data set to a more manageable size while retaining as much of the original information as possible (2) investigate the structure of a set of variables, and (3) create a suitable questionnaire to measure an underlying variable (Field, 2009; Hair, 2010).

However, some assumptions of PCA need to be validated. First, the measurement of variables in the research design need to be in consistent metrics (Creswell, 2009; Hair, 2010). The misleading use of variable measurement raises problems for data analysis inferences (Diamantopoulos & Schlegelmilch, 1997). In this study, the five-point Likert scale is employed, which measures the extent of the respondents' agreement or disagreement with statements provided in the questionnaire. The scale items are used to measure ordinal data and continuous variables. As a result, variables in this study are fulfilling the criterion required to conduct a PCA analysis.

Second, an adequate sample size is important. A common rule of thumb for an appropriate sample size is that the number of observations should be at least 10 times the number of variables to be analysed (Hair, 2010). In this research, the sample size is 207, and the largest number of variables needing to be analysed is 13 (EC maturity capacity variables-ECM) so the ratio of variables to observations is 1:16. Thus, this fulfils the requirement.

There is another criterion relating to the correlation matrix generated by the analysed variables. The correlation matrix can be evaluated by two statistical tests, the Bartlett Test of Sphericity (BTS) and the Keiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA). The latter generates an indicator ranging from 0 to 1. Hair (2010, p. 104) cited Kaiser (1974) the indicator above 0.80 is considered to be

‘meritorious’, a value from 0.70 is considered ‘middling’, a value above 0.60 is considered ‘mediocre’, a value from 0.50 is considered ‘miserable’, and below 0.50 is ‘unacceptable’. While the former test is a significant difference between correlation matrix and unity matrix, implying that the group of variables is acceptable for applying the PCA technique. To sum up, if the two statistical tests are fulfilled, a PCA can be used for further analysis (Hair, 2010).

The criteria used to obtain the number of components is very important for explaining the structure of the variables. According to Hair (2010), researchers should consider criteria such as eigenvalues or latent root criteria, Scree plot, total variance explain, and priori determination. Researchers also need to use different solutions to ensure the best explanations for the structure of variables.

The eigenvalue criterion indicates the percentage of explaining variances if the extracted factors are retained. The common rule is that components with an eigenvalue greater than 1 are chosen for further analysis (Kaiser, 1960). Another criterion is the Scree test, which relates to a plot generating by eigenvalues against a number of factors; the number of factors to be extracted is then based on the shape of the curve of the plot. Total variance explained is the percentage of variables’ variances. The more total variance explained increases, the more factors are chosen for extraction. Hair (2010) recommended that an extracting solution should account for at least 60% of the total variance of analysed variables. Last but not least, priori determination is chosen when researchers are aware of the number of factors in advance from previous studies.

In this thesis, all the requirements of the PCA assumptions were checked to ensure that the conditions were met. The latent root criteria were first employed, then the number of factors were fixed in accordance with the previous studies. The final extraction solutions were chosen to fulfil the requirement for sufficient factors to explain the total variability.

In the next section, the structures and validity of the variables are presented and discussed. The first variable group aims to measure benefits gained when an enterprise adopts certain levels of EC activity. The second variable group relates to measurement of the level of EC development in Vietnamese SMEs.

6.4 Structure of E-commerce Benefit Variables

E-commerce Benefit (ECB) variables aim to measure the advantages gained by enterprises when they adopt EC applications. This variable group consists of 12 variables—coded as B1 to B12. The PCA procedure was applied to reduce the composition of the ECB

variables. The sub-sections below present the results of running the PCA with the ECB variables, and comments on the reliability of the summarised variables.

Initially, the ECB variables were checked for the requirements of the PCA. Two conditions for the analysis were tested using the KMO and Bartlett's tests.The KMO index of the ECB variables was 0.868, indicating that the current data set was 'meritorious' and hence suitable for PCA (Kaiser, 1974). Similarly, the BTS result showed that the statistical test was significant, and that the correlation matrix generated by the analysed variables was sufficient for conducting the PCA analysis. Following, the Kaiser (1974) criterion, that is , that the eigenvalues should be greater than 1, the two components were retained, accounting for 57.6% of the variance in all variables. One variable (B3), however, had a low loading factor value (<0.5), and hence was dropped from the analysis. Accordingly, a modified model was re-estimated.

The final results showed that the KMO value (0.871) and the BTS test finding were suitable for PCA analysis. The total variance explained by the two extracted factors accounted for 60.4% of the total variance of the 11 variables (B1 to B12). The final results are presented in Table 6.5, which contains the correlation values between the EBC variables and the extracted components, and the estimated eigenvalues. The closer the value is to 1, the more the variance of a given variable can be explained by the variance of the extracted component.

Table 6.5: Summary of Principal Component Analysis for ECB variables

Scale items	**Components**	
	Improved business performance	**Reduced business cost**
B11. Improved competitive position	0.813	
B10. Increased revenue	0.779	
B8. Improved company image	0.759	
B12. Improved internal communication	0.756	
B7. Improved customer relationships	0.749	
B9. Improved inter-organisational communication	0.715	
B6. Improved process speed	0.670	
B4. Extending firm's reach	0.587	0.404
B5. Product/service differentiation	0.569	
B2. Reduced marketing costs		0.813
B1. Reduced operational costs.		0.804
Eigenvalues	5.499	1.148

Improved business performance: This component refers to improved business performance as a result of adopting EC activities, with the highest correlation value to *Improved competitive position* (0.813), followed by variables *Increased revenue* (0.779), *Improve company image* (0.759), *Improved internal communication* (0.756), *Improved customer relationship*(0.749), *Improved inter-organizational communication* (0.715), *Improved process speed* (0.670), *Extending firm's reach* (0.587), and *Product/service differentiation* (0.569).

Reduced business cost: This component refers to reduction of business costs when implementing EC business. It includes *Reduced marketing costs* (0.813) and *Reduced operation costs* (0.804).

6.5 Structure of E-commerce Maturity Variables

In order to understand the nature of e-commerce activities in SMEs, PCA were performed using thirteen E-commerce maturity variables (ECM) (coded as EC1 to EC13). The results are presented below.

KMO and BTS tests were first employed. An eigenvalue greater than 1 was chosen as the extraction criterion for consistency with the previous studies and for methodological rigour. The varimax rotation was then used to find the loading factor presenting correlations between variables and principal components. The rotation solution was chosen because of its wide acceptance. The technique also helped to make the pattern of variables correlated to the extracted components more distinct (Field, 2009; Tabachnick & Fidell, 2013). In other words, it helped to provide better explanations of the structure of the analysed variables (Molla & Heeks, 2007). In addition, the three components extraction is the clearest solution to interpret.

Two variables, with code EC04 and EC013, were eliminated due to low factor loading (<0.5). All variables were then re-entered to re-run the PCA model. Consequently, the results of the KMO (0.804) and BTS tests revealed that all ECM variables were suitable for further PCA. The findings are summarised and presented in Table 6.6, including eigenvalues, and factor loading values between the ECM variables and the extracted components.

Table 6.6: Summary of Principal Component Analysis for ECM variables

Scale items	Components		
	1	2	3
EC7. Our company allows customers to place orders through the company's Website.	**0.852**		
EC9. Our company accepts online payments and other methods (COD, bank account, master or credit cards, e-wallet, scratching cards...).	0.781		
EC8. Our company fulfils payments manually by bank transfer, COD, mobile credit.	0.744		
EC6. Our company gets feedback from customers through the company's Website.	0.716		
EC5. Our company often communicates with customers through social media sites such as Facebook, Twitter.	0.700		
EC12. Our company has dedicated IT staff and business staff to manage EC activities.		**0.901**	
EC11. Our company provides a link between online front-end and back-end systems.		0.824	
EC10. Our company allows for back-office data to support e-transactions.	0.412	0.705	
EC2. Our company uses the Internet for marketing and advertisements.			**0.819**
EC3. Our company publishes information about product descriptions, including prices on the Website.			0.770
EC1. Our company publishes information on the company's Website.			0.703
Eigenvalues	5.009	1.499	1.268

Advertisement index: The first component has high factor loading values in variables EC1, EC2, and EC3, which implies that SMEs use their Websites and Internet applications for promotional purposes; that is, their Websites have very basic functions like presenting key information about the products and services of the enterprises.

Transaction index: The second component relates to using Internet applications to support the order and transaction processes. For instance, enterprises accept orders from customers through their Website (EC7), and various payment methods are accepted, including online and offline (EC9, EC8). They can also receive and deal with feedback, and complaints from customers by communicating through the Website or social networks (EC6, EC5).

Intensive index: The third factor involves intensive EC adoption, where enterprises use more advanced applications and recruit more staff to support all business activities. That is, SMEs employ technology and business staff to run EC systems (EC12), front-office data from the Website are also connected to back-office data in an enterprises' database (EC11), and back-office data is used to support the transaction processes (EC10).

6.6 Reliability Analysis

Reliability analysis aims to assess the level of consistency between multi-dimensions of a proposed factor. There are two measurements to assess reliability of variables. The first measurement is test-retest which ensures that the responses are not different over time. The second measurement is internal consistency, which ensures reliability among variables in a summated scale (Hair, 2010). Cronbach's alpha is the most common measurement used to assess the reliability of the composition of variables. The general rule is to include variables with a Cronbach's alpha value of 0.7 (Robinson, Shaver, & Wrightsman, 1991; Shaver, Brennan, Robinson, Shaver, & Wrightsman, 1991), and a Cronbach's alpha value of 0.6 is considered to be valid in many exploratory studies (Robinson et al., 1991).

Reliability analyses of the ECM and ECB variables were performed. Results are shown in Tables 6.7. All values of Cronbach's alpha are well above 0.6, and are deemed to be sufficient for entering into further analysis.

Table 6.7: Reliability statistics for E-commerce indexes

Factors	Variable codes	Number of items	Cronbach's alpha
Advertisement index	EC1, EC2, EC3	3	0.708
Transaction index	EC5, EC6, EC7, EC8, EC9	5	0.869
Intensive index	EC10,EC11,EC12	3	0.856
Reduced business costs	B1, B2	2	0.619
Improved business performance	B4, B5, B6, B7, B8, B9, B10, B11, B12	9	0.900

Overall, the structures of the ECB and ECM variables were obtained as well as the validity of these variables was determined. The next section aims to highlight what patterns Vietnamese SMEs usually employ for conducting EC activities. This will also answer the question about whether EC adoption by Vietnamese SMEs can be compared and classified effectively based on theoretical evidences and analytical inferences of the survey data.

6.8 E-commerce Maturity

As mentioned above, this section aims to synthesise evidence from existing theories and real practices of Vietnamese SMEs in terms of the extent of EC adoption and use. First, an ECM index is created based on evidence from theory and the outcomes obtained from exploratory analysis. Second, B2C EC adoption of Vietnamese SMEs will be classified based on the distribution of the ECM index.

6.8.1 ECM Index Generation

From the theoretical perspective of the EC maturity Model or stage of EC adoption, EC usage can be classified into four levels of development, where the higher stages of the model are identified to be more complicated than the previous ones. These development stages are usually referred to in the extant literature as enterprises having a static Website, a communication Website, an order Website, or a transaction Website on the basis of the extent of their EC activities. Enterprises aligning with maturity stages tend to represent the more complex and advanced stages. This information has been explained and presented in Chapter 2.

On the other hand, the PCA results of the EC maturity variables indicate that there are three components (or latent factors) showing a high correlation with ECM variables. The first component consists of variables EC1, EC2 and EC3, with the highest Cronbach's alpha loading (0.85) explaining 64% variance of this component. The second component includes statements representing EC5, EC6, EC7, EC8 and EC9, of which, EC7 has the highest loading (0.81). The last component comprises variables EC10, EC11 and EC12, with the highest loading (0.90) aligned to EC12. The numerical evidence above indicates that Vietnamese SMEs adopt EC differently to the existing theoretical frameworks. SMEs in Vietnam mainly use Websites and other Internet applications as tools to receive orders from customers (EC7), accept online or traditional payments (EC9, EC8), and resolve feedbacks and complaints from customers (EC6). SMEs in Vietnam also often communicate with customers through social networking sites like Facebook (EC5). This means that Vietnamese SMEs use Websites for functions such as communication, and orders, and partly for conducting a few transactions from time to time. The last stage is intensive adoption, whereby SMEs recruit staff for all sorts of EC activities (EC12), connect front-end data from the Website to local data in companies (EC11), and use local data to support payment-related processes (EC10).

In order to compare the level of EC development amongst SMEs, an ECM index must be created. However, there are a few considerations that need attention prior to the creation of the ECM index. First, when there are two cases of EC adoption that have different EC indexes (advertisement index; transaction index; intensive index), the comparison of the two cases should follow the theoretical evidence (e.g. if an enterprise applying EC applications related to order and transaction Website (EC5, EC6, EC7, EC8, EC9) has higher levels of EC development than others that only apply EC applications using Website for promotional purposes (EC1, EC2, EC3). Second, when SMEs have the

same high EC index, if they apply the lower applications and have future plans for other applications, these application adoptions or future intents need to contribute to the level of EC development. For example, a given firm having the highest EC index value identified as a transacting index may apply some EC advertising applications in the future and move towards attaining an intensive index. If this is the case, the enterprise's EC activities are more complicated than those who do not adopt these extra applications or have any future plan to expand their EC activities.

Based on above the discussions and the nature of the EC scale, an ECM index has been created below:

$$\mathrm{ECM}_{\mathrm{index}} = \mathrm{Index1} * \mathrm{sign}(\mathrm{EC2} - 1) + (\mathrm{Index2} + \max\_\mathrm{index1}) * \mathrm{sign}(\mathrm{EC7} - 1) + (\mathrm{Index3} + \max\_\mathrm{index1} + \max\_\mathrm{index2}) * \mathrm{sign}(\mathrm{EC12} - 1) + \mathrm{Future}$$

where:

Sign(x)=1 if x≥0

=0 if x<0

Index1=Advertisement index=(EC1+ EC2+EC3)/3

Index2=Transaction index=(EC5+EC6+EC7+EC8+EC9)/5

Index3=Intensive index=(EC10+EC11+EC12)/3

max_index1=max(Advertisement index)

max_index2= max(Transaction index)

$\mathrm{Future} = \sum_1^{12} \mathrm{Sig}(\mathrm{ECi} - 1)\ /11$

with i=1,2,..12

Sig(x)=1 if x=0

=0 if x#0

Index1, Index2, Index3 are summated scales for extracted factors in Section 6.5;
max_index1, max_index2 are calculated based on the requirements of sequential stages in the theory.

6.8.2 EC Adoption Group

The ECM index was calculated for each case (for each enterprise) based on their EC adoption and usage. This index is also drawn in the dotted plot presented in Figure 6.1. As can be seen on the plot, there are three groups located separately. The first group has ECM scores from 0 to 5, and relate to SMEs using EC as a tool for advertising purposes only (84 cases, accounting for 40.6%), whereas the second group consists of SMEs with scores from 5 to 15 (57 cases, accounting for 27.5%) that use EC as a tool for online transactions and extra communication to customers. The last group includes enterprises with scores above

15 (66 cases, accounting for 31.9%) that hire all staff for EC activities and connect front-end data on the Website to back-end data in existing enterprises. These groups are the advertising, transacting, and intensive group, respectively. The latter groups are more advanced and complicated than the previous groups.

6.8.3 Adoption Trends

This section aims to investigate how various SMEs adopt EC. Characteristics of SMEs such as firm size, age, and ownership types will be analysed with EC indexes. Table 6.8 summarises the statistic tests of e-commerce indexes among SME groups.

Medium-sized enterprises are more innovative than smaller enterprises. For instance, the ANOVA results with independent firm size groups show that there are statistically significant observations in adopting EC as a marketing tool and a selling channel. Medium-sized enterprises (from 50 to 299 employees) have higher levels of EC development than small (from 9 to 50 employees) and micro-sized enterprises (from 1 to 9 employees). There are, however, no significant findings in terms of using these applications between micro and small-sized enterprises at the 0.5 level. With intensive EC adoption, no significant results have been found among enterprises.

In regard to using EC in various enterprises on the basis of firm age, the t-test shows that there is no significant statistical observation about EC adoption usage. This implies that EC applications are still of less concern to experienced small and medium-sized enterprises in Vietnam.

Based on the legal status of enterprises, the ANOVA test results reveal that proprietary limited enterprises adopt EC as marketing tools and as online sales channels for a significant length of time in comparison to private enterprises. This means that ownerships have an impact on the innovativeness of Vietnamese SMEs.

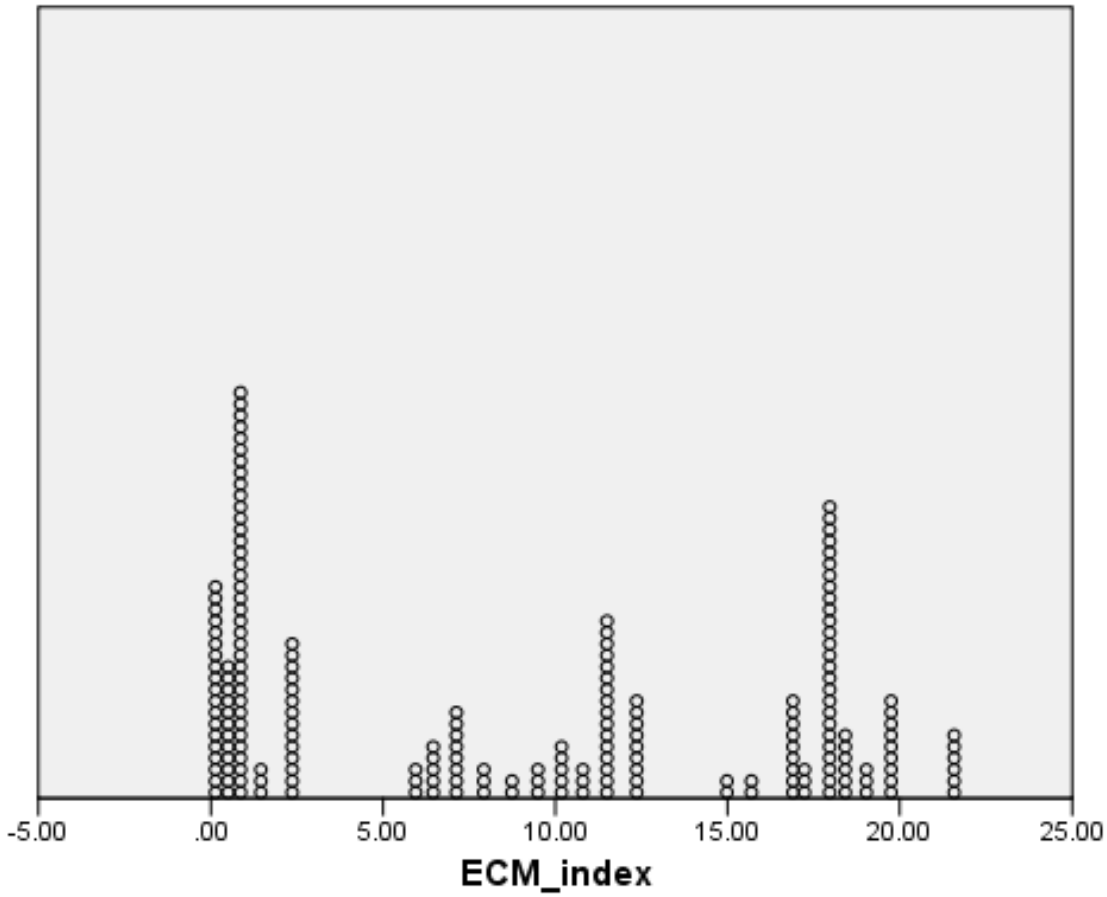


Figure 6.1: ECM index dotted plot

Table 6.8: Statistic tests for e-commerce indexes

Variables	Category Groups	Test statistics	P-value
	Enterprise size	F statistic	
Advertisement index	Es(3)>>Es(1),Es(2)	8.687	0.000
Transaction index	Es(3)>>Es(1),Es(2)	16.757	0.000
Intensive index	-	2.606	0.076
	Enterprise age	T statistic	
Advertisement index	-	0.158	0.875
Transaction index	-	-0.433	0.660
Intensive index	-	-0.667	0.506
	Legal status	F statistic	
Advertisement index	Ls(2)>>Ls(1)	5.379	0.005
Transaction index	Ls(2)>>Ls(1)	3.319	0.038
Intensive index	-	2.902	0.057

Es(1) indicates enterprise having 1-9 employees; Es(2) 10-49 employees; Es(3) 50-299 employees
Ls(1) indicates private enterprises; Ls(2) Proprietary limited; Ls(3) Joint stock
>> indicates that mean of left group was found to be significantly greater than mean of right group.

6.7 Factors Associated with E-commerce Maturity

This section will present the factors that impact on EC adoption stages. The differences in business activities among adoption groups are examined. In Table 6.9, the main findings about factors influencing e-commerce maturity are presented. Namely, the ANOVA tests are employed to examine the mean of factors relating to EC activities in three the dependent stage groups of EC adoption: advertising, transacting, and intensive group. The detailed results can be seen in Appendix C1—C4. The following sub-sections will present the findings of the data analysis of influencing factors of ECM, that is the entrepreneurial, technological, organisational, and environmental factors.

6.7.1 Entrepreneurial Factors

Top managers' activities play a critical role in EC adoption. It can be expected that the higher the EC maturity stage, the higher the level of support needed from an enterprise's leaders. However, *commitment, clear vision, communicating EC strategies, training* and *human support* to innovation of top managers are found to be higher in the transacting group compared to the advertising and Intensive groups (EF1, EF2, EF9, EF11).

6.7.2 Technological Factors

In terms of technological factors, the data analysis reveals that there are notable observations showing the relevance of technological factors amongst adoption groups. *Loss of important information* when adopting EC, for instance, raises more concerns with the intensive group than the transacting adoption group (TF5). The transacting adoption group also has a more positive attitude toward *receiving advantage* when adopting EC than the intensive group (TF15, TF17). Significant differences are observed among adoption groups in the variables *collaboration of IT and business staff* (TF2), *compatibility of existing technologies* (TF12), *observability* (TF24, TF25), and *Website availability* (TF31).

Table 6.9: Summaries of factors influencing EC adoption

Items	Advertising group (1) (Mean)	Transacting group (2) (Mean)	Intensive group (3) (Mean)	P at 0.05 level
1. **Entrepreneurial factors**				
1. Top management commitment (EF1)	3.8519	4.2985	3.6970	(2)>>(1),(3)
2. Top management vision (EF2)	3.8395	4.193	3.9545	(2)>>(1)
3. Communicate EC strategy to staff (EF9)	4.0000	4.2456	3.6364	(2)>>(3)
4. Education support (EF11)	3.8333	4.2456	3.8636	(2)>>(1)
2. Technological factors				
5. Collaboration of IT and business staff (TF2)	3.8571	4.0526	4.2424	(3)>>(1)
6. Loss of important information (TF5)	2.7857	3.2593	2.3651	(2)>>(3)
7. Compatibility of existing technologies (TF12)	3.6905	4.2632	4.3182	(2), (3)>>(1)
8. Relative advantage (better services) (TF15)	3.9167	4.2456	3.8636	(2)>>(3)
9. Relative advantage (benefit from market) (TF17)	3.9524	4.2105	3.7273	(2)>>(3)
10. Benefit observation from others (TF24)	3.6190	4.1930	3.9545	(2),(3)>>(1)
11. Benefit observation of practice (TF25)	3.7262	4.1579	3.4545	(2)>>(1),(3)
12. Website availability (TF31)	3.5833	4.0000	3.8788	(2)>>(1)
3. Organisational factors				
13. Flexible EC system (OF44)	3.7531	4.1930	3.7879	(2)>>(1),(3)
14. Adequate finance for EC adoption (OF1)	3.7976	4.4074	3.9242	(2)>>(1),(3)

Continue in next page

Table 6.9: Continue.

Items	Advertising group (1) (Mean)	Transacting group (2) (Mean)	Intensive group (3) (Mean)	P at 0.05 level
15. Computer systems (OF3)	3.6747	4.2321	3.8788	(2)>>(1),(3)
16. Staff competence (OF5)	3.9881	4.1579	3.6667	(2)>>(3)
17. Integration EC to enterprise strategy (OF43)	3.7143	4.1228	3.7143	(2)>>(1),(3)
18. Updating information about products (OF24)	4.0000	4.2807	3.7879	(2)>>(1),(3)
19. Post-purchase services (OF37)	3.9167	4.2593	3.6970	(2)>>(3)
20. Managing online customers (OF40)	4.1548	4.0877	3.8182	(1)>>(3)
4. Environmental factors				
21. Privacy Law to protect customers (EnF1)	3.4405	4.1930	4.0952	(2),(3)>>(1)
22. Law enforcement (EnF2)	3.6190	3.6140	4.2273	(3)>>(1),(2)
23. Training program from government (EnF4)	3.9048	3.3137	3.7121	(1)>>(2)
24. Finance and advice from government (EnF5)	3.9524	3.2745	3.5152	(1)>>(2)
25. Competitive environment in e-commerce (EnF13)	3.7262	4.1404	3.7576	(2)>>(1),(3)
26. Availability of experts (EnF23)	3.6786	4.0556	3.3788	(2)>>(3)
27. Support from technology vendors (EnF26)	3.4881	3.9608	3.9242	(2),(3)>>(1)
28. Level of online customer trust (EnF10)	2.4881	2.3333	1.8939	(3)>>(1)
29. Cost of EC solutions (EnF16)	1.8095	1.7719	2.2424	(3)>>(1),(2)
30. Level of logistics development (EnF22)	2.3500	2.2900	1.7900	(1),(2)>>(3)

Symbol " >>"indicates that the mean value of left group was found to be significantly greater than the mean value of right group.

6.7.3 Organisational Factors

Perceptions of the advertising and intensive groups are different in terms of *adequate finance* (OF1) and *computer system* (OF3) to apply EC. *Updating information* about products on the Website (O24) has been found to be a significant statistic between the intensive group and the transacting group. There is also a statistically significant observation between the intensive group and the transaction group in *staff competence* for EC adoption (OF5). Furthermore, the transacting group focuses more on *post-services* than the advertising and intensive groups (OF37). Interestingly, the results of analysis reveal that the advertising group places more stress on *managing online customers* than the intensive group (OF40). *Integrating EC into enterprise strategy* (OF43) and *flexible EC system* (OF44) are found to be different among the adoption groups.

6.7.4 Environmental Factors

The data analysis shows that the intensive group is more concerned about the level of online *customer trust* (EnF10) and level of *logistics development* (EnF22) than the advertising group. Logistics are also perceived to be less of a problem in the transacting group compared to the intensive group. The transacting group easily finds *suitable experts* for their online business compared to the intensive group (EnF23). There is also a lack of *help from technology vendors* in the advertising group compared to the transacting and intensive groups (EnF26). Moreover, the advertising group has a lack of confidence with *customer privacy law* in comparison to the intensive group (EnF1). The intensive group is less concerned about *law enforcement* than the transacting and advertising groups (EnF2). There are significant statistical differences between the groups with the variables: *support from the government* (EnF4, EnF5), *competition pressure* (EnF13), and *cost of EC solution* (EnF16).

6.7.5 EC Benefits Associated with EC Maturity

There are statistically significant scores amongst adopting groups with regard to benefits of EC adoption. The transacting group has more benefits than the advertising groups in terms of *reduction of operational cost* (B1), *expanding the market* (B4), *improved process speed* (B6), *improving inter-organisational communication* (B9), *improved competitive position* (B11), *improved business performance* and *reduced business cost. Improved customer relationship* (B7) is noticeably different between the advertising group

and the more mature groups. Interestingly, there is no clear distinction between the transacting group and the intensive group in terms of benefits received from EC adoption.

6.8 CSFs and Barriers Associated with ECM

The next section will present the exploration of CSFs and barriers that Vietnamese SMEs face in terms of their adoption and implementation of B2C EC. These CSFs and barriers are examined in various SME groups based on characteristics such as firm size, type of ownership, and firm age.

6.8.1 CSFs Exploration

In order to explore CSFs, all variables and ECB variables were entered the non-parametric correlation analysis test, Spearman's rho, at each maturity stage. The detail results are presented in Appendix D1.

The criteria for identifying CSFs are taken into account. Following the definition of Rockart (1979) about CSFs, CSFs are regarded as key areas that ensure the success of business activities when an enterprise achieves them. With regard to the analytical results, Cohen (1988) suggested that in the correlation analysis, the strength of the relationship of the coefficient values from 0.1 to 0.3 is weak, from 0.3 to 0.5 indicates a medium correlation, and values greater than 0.5 imply a strong relationship.

The criteria are set based on the evidence above. Initially, non-significant correlations, at threshold 0.05, and small correlation values (≤ 0.3) are omitted from the analysis. The success factors are determined if the correlation coefficient value of the factors has a large value (>0.5) in at least two adoption stages, or has a medium value (>0.3) in all adoption stages. The CSFs associated with the different stages of adoption are presented in Table 6.10.

Table 6.10: CSFs in stages of adoption of EC

Factors	Stages		
	1	2	3
Accessibility of Website (TF31)	X	X	X
Strategy lead in EC implementation (OF13)	X	X	X
Openness culture of communication (OF16)	X	X	X
Updated information about products (OF24)	X	X	X
Focus on online marketing practises (OF31)	X	X	X
Building brand image (OF32)	X	X	X
Building customer trust (OF33)	X	X	X
Return and refund policy (OF37)	X	X	X
Top management commitment (EF1)		X	X
Top management vision (EF2)		X	X
Open-mindedness to innovation (EF6)		X	X
Accessibility to computer system (OF9)		X	X
Good advertising campaign (OF29)		X	X
Integrating online and offline marketing practises (OF30)		X	X

Symbol "X" indicates the value in a given factor satisfying the criteria above.

6.8.2 CSFs Associated with Enterprise Size, Ownership Types, and Age

This section aims to investigate how CSFs differ based on the different characteristics of Vietnamese SMEs. Table 6.11 summarises CSFs between SME groups classified by enterprise size, ownership and age of operation.

Commitment and the *open-minded nature of leaders* to EC have found significantly among private and proprietary limited enterprises (EF1, EF6). For example, proprietary limited enterprises have more commitment and open-mindedness to innovations than private enterprises.

Analytical results show that medium-sized enterprises have higher scores than small-sized enterprises in terms of *accessibility of the Website* (TF31), *strategy-led EC implementation* (OF13), *integrating online and offline marketing practices* (OF30), and *return and refund policy* (OF37). It is evident that small and medium-sized enterprises have *clearer vision* (EF2) on EC related activities than micro-sized enterprises. Micro enterprises, however, have better *accessible Websites* (TF31) and *advertising campaign* (OF29) than small-sized enterprises. *Updated information about products* on the Website receives more focus from medium-sized enterprises than micro-sized enterprises (OF24).

Also, the t-test reveals that old enterprises have higher scores in some CSFs than young enterprises, thus showing the significance of firm age. This result implies that

experienced enterprises employ more extensive EC business activities than their less-experienced counterparts.

Table 6.11: Statistics tests for CSFs among SMEs characteristic groups

Variables	Category Groups	Test statistic	P value
	Enterprise size	**F statistic**	
Top management vision (EF2)	Es(2),Es(3)>>Es(1)	4.028	0.019
Open-mindedness to innovation (EF6)	Es(2)>>Es(1)	2.860	0.060
Accessibility of Website (TF31)	Es(1),Es(3)>>Es(2)	7.287	0.001
Strategy lead in EC implementation (OF13)	Es(3)>>Es(2)	3.066	0.049
Updated information about products (OF24)	Es(3)>>Es(1)	3.749	0.025
Good advertising campaign (OF29)	Es(1)>>Es(2)	4.641	0.011
Integrating online and offline marketing practises (OF30)	Es(3)>>Es(2)	3.994	0.020
Post-purchase service (OF37)	Es(3)>>Es(2)	3.955	0.021
	Enterprise age	**T statistic**	
Top management commitment (EF1)	Ea(2)>>Ea(1)	3.116	0.002
Top management vision (EF2)	Ea(2)>>Ea(1)	2.394	0.018
Updated information about products (OF24)	Ea(2)>>Ea(1)	2.017	0.045
Good advertising campaign (OF29)	Ea(2)>>Ea(1)	2.671	0.008
Integrating online and offline marketing practises (OF30)	Ea(2)>>Ea(1)	2.314	0.022
Accessibility to computer system (OF31)	Ea(2)>>Ea(1)	2.454	0.015
Building brand image (OF32)	Ea(2)>>Ea(1)	2.391	0.018
Building customer trust (OF33)	Ea(2)>>Ea(1)	2.371	0.019
Post-purchase service (OF37)	Ea(2)>>Ea(1)	2.223	0.019
	Legal status	**F statistic**	
Top management commitment (EF1)	Ls(1)>>Ls(2)	11.013	0.000
Open-mindedness to innovation (EF6)	Ls(1)>>Ls(2)	3.665	0.029

Es(1) indicates enterprise has 1-9 employees; Es(2) 10-49 employees; Es(3) 50-299 employees
Ea(1) indicates enterprises operating less than 5 years; Ea(2) Operating more than 5 years
Ls(1) indicates private enterprises; Ls(2) Proprietary limited; Ls(3) Joint stock
>> indicates that mean of left group was found to be significantly greater than mean of right group.

6.8.3 Barriers to EC Adoption

In order to investigate barriers that SMEs face when adopting EC, all responses from participants with a score value lower than 3 were scanned. This figure meant that in a given statement, the activities relating to the statements were problematic in e-commerce

adoption and implementation of enterprises. In other words, this particular factor is a barrier for those enterprises. Table 6.12 shows the top 15 barriers identified in this study that prevent SMEs from employing EC activities.

Table 6.12: List of barriers when adopting e-commerce

Barrier names*	N	%
EC solution cost (EnF16)	198	97
Training cost (EnF17)	198	97
Setup and maintenance cost (EnF18)	198	97
Trialability (TF20)	196	95
Level of credit card usage (EnF11)	190	93
Level of online customer trust (EnF10)	186	90
Product characteristics (OF22)	182	89
Infrastructure of commercial and financial organisation (EnF20)	164	83
Level of logistics development (EnF22)	161	84
Risk of loss of important information(TF5)	135	67
Restriction when doing online business (TF023)	75	37
Incompatibility with traditional business (TF04)	74	37
Finance and consultant support from government (EnF05)	67	33
Top management commitment to EC activities (EF01)	65	32
Telecommunication infrastructure (EnF019)	62	31

*codes with prefix En, TF and OF denote environmental, technological and organisation factors, respectively.

The top three barriers relate to cost of running the EC system (EnF16, EnF17, EnF18). Other factors are factors are *the ability to try EC on some basis* (TF20), *level of online customer trust* (EnF10), *product characteristics* (OF22), *level of infrastructure of commercial and financial organisation* (EnF20), *level of logistics development* (EnF22), *perceived risk of loss of important information* (TF5), *restrictions when doing online business* (TF23), *incompatibility with traditional business* (TF4), *financial and consultant support from government* (EnF5), *top management commitment to EC activities* (EF1), and *telecommunication infrastructure* (EnF19).

According to Table 6.9, the *EC solution cost* is more problematic for the advertising and transacting groups than the intensive group (EnF16). On the other hand, *logistics development* poses more problems in the intensive group than the advertising and transacting groups. *Level of online customer trust* raises more concerns in the intensive group than the advertising group (EnF10). Perception of loss of important information is bigger barrier in the intensive stage than the transacting adoption stage (TF5). The transacting group receives less *financial and consultant support from government* than

advertising group. *Top managers* in the transacting group have more commitment to e-commerce activities than their counterparts in the advertising and intensive group (EnF1).

6.8.4 Barriers Relative to SME Characteristics

This section will analyse these barriers in relation to firm size, age, and ownership types. Table 6.13 reveals information about barriers among the SME groups.

The ANOVA results show that there are different means scores among ownership types, including *financial infrastructure* (EnF20), *top management commitment* (EnF1), *telecommunication infrastructure* (EnF19).

The data analysis results reveal that there are notable observations among various enterprise sizes with the variables: *product characteristics* (OF22), *level of logistics development* (EnF22), *restrictions when doing online business* (TF23).

The t-test was performed to check any differences between enterprises, that had been operating for less than five years and those that had been operating for more than five years. There are only differences are observed in the variables *incompatibility with tradition business* (TF4), *support from government* (EnF5), *privacy law* (EnF1). The young enterprises appeared to have more difficulty facing these barriers than older enterprises, due to the fact that young SMEs have less business experience for conducting EC activities than older SMEs.

Table 6.13: Statistics tests for barriers among category groups

Variables	Category Groups	Test statistic	P value
	Enterprise size	**F statistic**	
Restriction from doing online business (TF23)	Es(1),Es(2)<<Es (3)	4.385	0.014
Restriction of product characteristics (OF22)	Es (3)<< Es (2)	4.067	0.019
Level of logistics development (EnF22)	Es (1)<< Es (2)	3.072	0.049
	Enterprise age	**T statistic**	
Top manager commitment to EC activities (EF1)	Ea(1)<< Ea (2)	3.116	0.002
Incompatibility with traditional business (TF4)	Ea (1)<< Ea (2)	3.505	0.001
Finance and consultant support from government (EnF5)	Ea (1)<< Ea (2)	2.203	0.029
	Legal status	**F statistic**	
Top management commitment to EC activities (EF1)	Ls(1)<< Ls (2)	8.203	0.000
Telecommunication infrastructure (EnF19)	Ls (2)<< Ls (1)	5.067	0.007
Infrastructure of Commercial and financial organisation (EnF20)	Ls (1)<< Ls (2), Ls(3)	5.928	0.003

Es(1) indicates enterprise has 1-9 employees; Es(2) 10-49 employees; Es(3) 50-299 employees
Ea(1) indicates enterprises operating less than 5 years; Ea(2) Operating greater 5 years
Ls(1) indicates private enterprises; Ls(2) Proprietary limited; Ls(3) Joint stock
Symbol "<<" indicates that mean value of left group was found to be significantly smaller than mean value of right group.

6.9 Logistic Regression and Estimated Models

The foregoing analyses indicated that there are important factors to consider at different stages of adoption of EC in SMEs.

Key decision makers can see that EC activities may be adopted in stages, from the simplest the most complex. In addition, the transacting and intensive groups can contain some activities from the less advanced stages, thus it is logical to identify factors that influence the decisions of business owners at different stages of adoption. From a practical perspective, two general models are possible. First, business owners can decide to adopt EC in sequential manner, thus they would begin with employing EC for promotion only, then progress to online selling, and then use EC intensively for all activities, including hiring more staff. Secondly, it could also be assumed that once a decision is made to adopt EC, business owners can decide at which particular stage they wish to begin, and this inform of the corresponding activities. Therefore, to assist in quantifying the effects of different variables on the level of adoption, four empirical models are estimated: (i) the base model assumes that decisions are a sequential process, that is, from simple to advanced activities, (ii) three models examine the factors affecting decisions at each level (advertising stage, transacting stage and intensive stage). Practically, the base model variable is coded from 1

to 3, according to the sequence of EC adoption: advertising, transacting, and intensive groups. With the three models 1,2,3, an analysed stage is coded as 1 whereas the rest is coded as 0.

A logistic regression model is given in equation 6.1 or 6.2 (Field, 2009),

$$Logit = \ln\left[\frac{P}{1-P}\right] = b_0 + b_1X_1 + \cdots \ldots \ldots \ldots + b_nX_n \quad (6.1)$$

Accordingly, the odd ratio is computed as: $Odd\ ratio = e^{\frac{P}{1-P}} = e^{b_0+b_1X_1+\cdots\ldots\ldots+b_nX_n}$ (6.2)

where P is the probability of the event occurring, its value lying between 0 and 1; b_0 is an estimated constant; and b_n is the estimated coefficient of the n^{th} variable in the model. In this section, P indicates the probability of SMEs adopting the advertising stage, the transacting stage, or the intensive stage.

Before the empirical analysis, the t-test and one way ANOVA test were employed to explore possible variables that impact on these models. However, these tests only examined one variable at a time, while the logistic-based regression will estimate the magnitude of each variable contributing to the predictive models (Table 6.14). There are several models estimated. The base model is estimated based on an assumption that three stages are ordered from the simplest stage to the most complicated stage. Similarly, Models 1, 2, and 3 are applied to set out what features are associated with SMEs in the advertising, transacting, and intensive stage, respectively. The statistical procedure is applied due to the discrete nature of the dependent variable, namely EC maturity stages (Agresti, 1996).

Table 6.14: Variables in estimated models

No.	Variable Items	Model 0	Model 1	Model 2	Model 3
	Entrepreneurial Factors				
1	Management commitment (EF1)	X		X	X
2	Top management vision (EF2)	X		X	
3	Strategy communication (EF9)	X		X	X
4	Education support (EF011)	X		X	
	Technological factors				
5	Collaboration of staff (TF02)	X	X		X
6	Loss of important information (TF5)	X		X	X
7	Technology compatibility (TF12)	X	X		X
8	Perceived better services (TF015)	X		X	
9	Perceived better benefit (TF17)	X		X	X

Continue in next page

Table 6.14: Continued.

No.	Variable Items	Model 0	Model 1	Model 2	Model 3
10	Better value customer (TF21)			X	
11	Seeing success from others (TF24)	X	X	X	
12	Seeing success from practises (TF25)	X		X	X
13	Good navigation Website (TF26)			X	
14	Accessibility of Website (TF31)	X	X		
	Organisational factors				
15	Adequate finance (OF1)	X	X	X	
16	Computers systems (OF3)	X	X	X	
17	Staff Competence (OF5)	X		X	X
18	Clear metrics (OF21)			X	
19	Variety of information (OF23)			X	
20	Updated information of product (OF24)	X		X	X
21	Post-purchase services (OF37)	X		X	X
22	Customer relation management (OF40)	X	X		X
23	Integrated EC strategy (OF43)	X		X	
24	Flexible system (OF44)	X		X	
	Environmental factors				
25	Privacy law (EnF1)	X	X	X	X
26	Law enforcement (EnF2)	X	X		X
27	Training support from government (EnF4)	X	X	X	
28	Finance and advice support from government (EnF5)	X	X	X	
29	Online customer trust (EnF10)	X	X		
30	Competitive environment (EnF13)	X		X	
31	Cost of EC solutions (EnF16)	X			X
32	Logistics systems (EnF22)	X			X
33	Expert availability (EnF23)	X		X	X
34	Support from technology vendors (EnF26)	X	X	X	
35	Communication channels (D10)		X		

Symbol "X" indicate a given factor is found significantly in the models.

6.9.1 Logistic Regression Assumptions

6.9.1.1 Multicollinearity

Results generated from the logistic regression may be influenced by multicollinearity. Multicollinearity is caused by a high correlation between two or more independent variables in the logistic models. The existence of multicollinearity can lead to rejecting important predictors in the model. Menard (2002) suggests that multicollinearity can be detected by tolerance test values or the variance inflation factor (VIF). He added that tolerance values of less than 0.1 indicate the existence of multicollinearity impact. VIF values of greater than 10 indicate multicollinearity problems (Field, 2009). When multicollinearity exists, there are some options for dealing with it (Tabachnick & Fidell, 2013). First, if the purpose of the analysis is to predict a model, these variables can be ignored. Second, deletion of the variables causing multicollinearity is chosen but it may give rise to an omitted variables bias. The third option is to calculate the sum or average of these collinear variables. Fourth, a PCA model can be estimated to group the collinear variables. Centre collinear variables also help to reduce multicollinearity.

With regard to the data, there is evidence of multicollinearity whereby some variables within each category are highly correlated with each other. These variables are checked and verified with respect to their intended meaning and thus combined into new scales. All these scales satisfy the validity conditions, specifically, the Cronbach alpha value is greater than 0.6 (Appendix E1). The final modified variables used in the empirical models are listed in Table 6.15.

6.9.1.2 Sample size consideration

The issue of an adequate sample size to run a logistic regression model is not been widely addressed in the existing literature (Peng, Lee, & Ingersoll, 2002). One reason is that a very small proportion of research studies have explored this issue (Hosmer & Lemeshow, 2000). Some authors suggest that the minimum observation-variable ratio for the logistic regression model is 10:1, with a minimum sample size of 50 or 100, and there are a number of independent variables as predictors (Hair, 2010; Tabachnick & Fidell, 2013). LeBlanc and Fitzgerald (2000, p. 356) recommended that an observation-variable ratio greater than 30 is required. However, DeMaris (1992) stated that with a limited number of independent variables in a logistic model, inferences obtained from the logistic model are still adequate even with a small sample size.

6.9.2 Logistic Regression Results

Four models are examined for goodness-of-fit tests and validity. With the ordinal logistic model, the parallel line test is employed to check the stability of the estimated coefficients when changing response categories. The test result is non-significant (0.299), implying that the assumption of EC adoptions is sequential. The goodness-of-fit test is significant, showing that the estimated model is found to be statistically better than the model without variables. On the other hand, Model 1,2, and 3 are found to be statistically non-significant with the Hosmer-Lemeshow goodness-of-fit statistic (Appendix E2), indicating that there are no differences between actual values and estimated values in the models. In other words, the models classify observed data very well (Field, 2009; Hair, 2010).

In Table 6.16, the results from the logistic regression models are summarised. The dependent variables are category values. Namely, with the base model, its values are 1, 2, and 3 corresponding to SMEs in the advertising, transacting and intensive stages, respectively. This is similar with Models 1, 2, and 3; for example, the dependent value in Model 1 is 1 if a SME is in the advertising stage, whereas SMEs in other stages are set at 0. The estimated coefficients and odd ratio in parenthesis for input variables are presented in the table. The odd ratio in a given variable indicates the ratio of the probability between the value of the dependent value at 1 and at 0 when the variation of the variable is set at 1 and the variation of other variables are unchanged. Therefore, the odd ratio can be calculated for a given variable when the variation of the analysed variable is equal to one unit (Field, 2009).

Sequential logistic regression in the base model shows that *observability of success* practices (3.579), *cost of EC solutions*(3.522), and *legal framework* (2.465) have strong impacts on developing EC activities. On the other hand, *updated information of products* (0.309), *customer relationship management* (0.401), *top management support* (0.513), and *adequate finance* (0.510) are barriers preventing SMEs from undertaking EC development.

Determinants that identify a given group with the rest vary with each group. With the advertising group, the binary logistic regression reveals that factors such as *support from government* (10.913), *online customer management* (4.393), and *communication channels* (2.361) play strong roles in distinguishing the advertising group from other groups. In contrast, *legal framework* (0.153), *support from technology vendors* (0.255), and *adequate finance* (0.437) are obstacles for this group in EC business.

In regard to the transacting group, *updated information* about products (5.928), o*bservability of success* (4.706), and *perceived providing better customer values* (3.164) are critical determinants in this group compared to the rest. In contrast, *clear metrics* (0.069), and *government support* (0.488) prevent the transacting group from undertaking EC activities.

The statistical results show that *legal framework* (4.225), *cost of EC solutions* (2.921), and *collaboration of staff* (2.179) determine the intensive group and lower development of the EC groups, although the *collaboration of staff* factor is found to be significant at the 10% value. This group are problematic in some activities such as *updated information of products* (0.349), *logistic systems* (0.495), and *top management support* (0.456).

6.10 Discussion

The goal of this chapter was to examine what patterns determine the adoption and implementation of e-commerce by Vietnamese SMEs. The PCA results showed that the Vietnamese SMEs apply EC differently to what the existing theoretical frameworks suggest. For example, the business life cycle stage of maturity model concludes that EC adoption can be applied in six sequential stages: no Internet connection, having connection to the Internet (but no Website), static Website, interactive Website, transactive Website, and integrated Website. The later stages are more advanced and complicated than the earlier stages. Vietnamese SMEs adopt e-commerce innovation in the same manner in the first stage (static Website or advertising Website), that is, SMEs set up a static Website for extending advertising activities. However, from the second stage, they employ Internet applications as an extra communication channel (e.g. social networks) to receive feedback, deal with complaints from customers and accept orders and online transactions from customers. In the third stage, firms employ extensive business and IT staff for EC activities, and front-office data from the Website are also connected to local back-office data in enterprises to support for transaction processes. On the other hand, SMEs tend to adopt the theoretical communication stage and the ordering stage at the same time. The last stage is employed fully with extensive staff and connected data to support transaction processes.

Table 6.15: The modified variables in the estimated models

No.	Variable Items	Model 0	Model 1	Model 2	Model 3
	Entrepreneurial factors				
1	Top management support (EF)	X		X	X
	Technological factors				
2	Collaboration of staff (TF02)	X	X		X
3	Loss of important information (TF5)	X		X	X
4	Technology compatibility (TF12)	X	X		X
5	Perceived relative advantage (TF015_17)	X		X	X
6	Better value customer (TF021)			X	
7	Observability of success practices (TF024_25)	X	X	X	
8	Good navigation Website (TF026)			X	
9	Accessibility of Website (TF031)	X	X		
	Organisational factors				
10	Adequate finance (OF01)	X	X	X	
11	Computers systems (OF03)	X	X	X	
12	Skilled staff (OF05)	X		X	X
13	Clear metrics (OF021)			X	
14	Variety of information (OF023)			X	
15	Updated information of product (OF024)	X		X	X
16	Post-purchase services (OF037)	X		X	X
17	Customer relation management (OF040)	X	X		X
18	Integrated EC strategy (OF043)	X		X	
19	Flexible system (OF044)	X		X	
	Environmental factors				
20	Legal framework (EnF01_ 02)	X	X		X
21	Government support (EnF04_05)	X	X	X	
22	Online customer trust (EnF10)	X	X		
23	Competitive environment (EnF013)	X		X	
24	Cost of EC solutions (EnF16)	X			X
25	Logistic systems (EnF22)	X			X
26	Expert availability (EnF023)	X		X	X
27	Support from technology vendors (EnF026)	X	X	X	
28	Communication factors (D10)		X		

Symbol "X" indicates a given factor is found significantly in the models.

Table 6.16: Summaries of estimated models and coefficients values.

No.	Variable Items	Model 0 Estimated coefficients (odds ratio)	Model 1 Estimated coefficients (odds ratio)	Model 2 Estimated coefficients (odds ratio)	Model 3 Estimated coefficients (odds ratio)
	Entrepreneurial Factors				
1	Top manager supports (EF)	-0.667* (0.513)		-	-0.785** (0.456)
	Technological factors				
5	Collaboration of staff (TF02)	-	-		0.779* (2.179)
6	Loss of important information (TF5)	-		0.506** (1.659)	-0.568** (0.567)
7	Technology compatibility (TF12)	-	-		-
8	Perceived relative advantage (TF015_17)	-		-	-
10	Better value customer (TF021)			1.152** (3.164)	
11	Observability of success (TF024_25)	1.275** (3.579)	-	1.549** (4.706)	
13	Good navigation Website (TF026)			-	

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Table 6.16: Continued.

No.	Variable Items	Model 0	Model 1	Model 2	Model 3
14	Accessibility of Website (TF031)	-	-0.714*		
			(0.490)		
	Organisational factors				
15	Adequate finance (OF01)	-0.673*	-0.827*	-	
		(0.510)	(0.437)		
16	Computers systems (OF03)	0.407*	-0.756**	0.798**	
		(1.502)	(0.470)	(2.221)	
17	Skilled staff (OF05)	-0.534*		-	-0.519*
		(0.586)			(0.595)
18	Clear metrics (OF021)			-2.670**	
				(0.069)	
19	Variety of information (OF023)			-	
20	Updated information of product (OF024)	-1.174**		1.780**	-1.052**
		(0.309)		(5.928)	(0.349)
21	Post-purchase services (OF037)	-		-	-
22	Customer relation management (OF040)	-0.915**	1.480**		-
		(0.401)	(4.393)		
23	Integrated EC strategy (OF043)	-		-	
24	Flexible system (OF044)	-		-	

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Table 6.16: Continued.

No.	Variable Items	Model 0	Model 1	Model 2	Model 3
	Environmental factors				
25	Legal framework (EnF01_ 02)	0.902*	-1.876**		1.441**
		(2.465)	(0.153)		(4.225)
27	Government support (EnF04_05)	-0.425*	2.390**	-0.718**	
		(0.654)	(10.913)	(0.488)	
29	Online customer trust (EnF10)	-	-		
30	Competitive environment (EnF013)	-		-	
31	Cost of EC solutions (EnF16)	1.259**			1.072**
		(3.522)			(2.921)
32	Logistic systems (EnF22)	- 0.545**			-0.704**
		(0.580)			(0.495)
33	Expert availability (EnF023)	-		0.732**	-
				(2.079)	
34	Support from technology vendors (EnF026)	-	-1.367**	-	
			(0.255)		
35	Communication channels (D10)		0.859**		
			(2.361)		

Asterisks * and ** indicating p value at 0.10 and 0.05, respectively.

SMEs groups that were classified according to characteristics of size, age, and legal status were examined with regard to their EC applications. the data analysis indicated that medium-sized enterprises have higher levels of the advertising and transaction indexes than small-sized and micro-sized enterprises. This means that medium-sized enterprises use Website technologies for both advertising and extra transaction activities sooner than small-sized and micro-sized enterprises. With these two indexes, proprietary limited enterprises were found to have higher scores than private enterprises. However, there was no statistical significance amongst SMEs with different ages in all the indexes.

In order to compare levels of EC maturity of SMEs, an adoption index was created based on theoretical requirements, analysis of results, and the nature of the variable scale. E-commerce adoption by SMEs were classified into three adoption groups as a result of creating the adoption index. The benefits received in each stage were then analysed. The statistical findings revealed that only the transacting group gains higher benefits from EC activities than the advertising group. Surprisingly, there was no significance in regard to benefits received between the intensive group and the other groups.

Entrepreneurial, technological, organisational, and environmental factors were analysed for the adoption groups. The general trend was that the transacting group is more active than the other groups, as the scores of this group in many factors were higher than those of the remaining groups. The reasons will be discussed further in Chapter 7.

With regard to entrepreneurial factors, top managers of the transacting group have more commitment, clearer vision, more efficient EC strategy communication , and provide more support in education and training to staff than the advertising group and intensive groups.

In terms of technological factors, the transacting group had greater values in perceived loss of important information, compatibility of existing technologies in enterprises, perceived superior services, perceived gain in income from the market, flexible EC system, clearly seeing success from other enterprises, seeing benefits from existing practices, and accessibility to the Website compared to the advertising and intensive groups. Only collaboration of IT and business was significant in the intensive group and the advertising group.

In a similar trend, some organisational factors, such as adequate finance for EC activities, well-equipped computer and local network system, EC strategy integrated with the enterprise strategy, updated information about products on Website, staff skills, return and refund policy were found to be different between the transacting group and the

intensive and advertising groups. Interestingly, managing online customer practice is more focused in the advertising group than the intensive group.

The transacting and intensive groups are less concerned about privacy law protecting customers and receive more help from technology vendors than the advertising group. The intensive group has a more positive attitude toward law enforcement and are more concerned with EC solution costs than the advertising and transacting groups. The transacting group perceives less competition in the online business than the advertising and intensive groups. Government support is less useful for the transacting group than the advertising group. Level of logistics development is more problematic for the advertising and transacting groups than the intensive group.

All critical success factors relate to the real abilities of good management activities, strong support inside enterprises, and good strategy to support their customers. Many important factors that have a strong impact on EC benefit were found in the transacting and intensive groups. It was possible to show that enterprises in the higher stages gain more benefits than enterprises in the lower stage. Also, these factors were analysed with SME characteristics. It is evident that top managers in private enterprises are more committed and open minded to innovation than their counterparts in proprietary limited enterprises. Joint stock enterprises rate the variable *perceived benefit opportunities from other enterprise practices* higher than proprietary limited enterprises. Large-sized enterprises seem to be more focused on the activities relating these factors, namely, strategy lead in EC implementation, updating information about products on the Website, integrating online and offline marketing practices, providing good post-purchase services, top management vision, open-mindedness of leaders to innovation. The *good advertising campaign* factor was found to be less focused in small enterprises than micro enterprises. Small enterprises' Websites are less accessible than those of medium and micro enterprises. Finally, CSFs were examined in young and old enterprises, and the result showed that experienced enterprises perform these activities relating to CSFs better than the less-experienced enterprises.

The third purpose of this chapter was to explore the barriers and examine these obstacles alongside the characteristics of Vietnamese SMEs. Most of the barriers related to the business environment, with only one barrier relating to existing practices in enterprises, namely, the commitment of leaders to innovation. Smaller-sized enterprises are more problematic than larger size enterprises in dealing with low levels of logistics development and restrictions when adopting EC. However, medium-sized enterprises are more restricted

when implementing EC than small-sized enterprises due to the characteristics of their product offerings. Younger enterprises face more difficulties than older enterprises when adopting EC, namely, compatibility with the traditional business model, receiving sufficient financial and consultant support from government, and top management commitment. When barriers were taken into account among the adoption groups, there was an interesting finding that the intensive group is less committed to EC implementation and more concerned about losing important information than the transacting group. The intensive group, however, has a more positive attitude toward the level of online customer trust and cost of EC solution than the advertising and transacting groups.

Some factors exchange roles in terms of barriers, CSFs, and influencing factors. For instance, top management commitment can be an obstacle in EC adoption, but if SMEs can conquer this barrier, it will ensure success for enterprises. This factor also has an impact on EC maturity. Other factors such as perceived loss of important information and financial and consultant support from government are considered to be barriers to EC adoption. This situation can be seen in some factors where they are able be both CSFs and influencing factors, namely, clear vision of top managers about EC activities, frequency updating information on Website, and good return and refund policy. Interestingly, some factors are barriers to EC activities but are not factors that impact on the decision of SMEs to move from a simple stages to an advanced stage. Such factors are training cost, maintenance costs, triability, level of trust and usage of customers, product characteristics, financial infrastructure, telecommunication infrastructure, risk of loss important information, restriction of doing online business, and incompatibility with the traditional business.

Finally, this chapter aimed to assess the key factors that determine the growth of EC activities, and identify unique features relating to each adoption stage. Four models were proposed and examined. The results showed that some factors, including cost of EC solutions, observability of success practices, and the legal framework, are determinants in distinguishing low to high EC stages, and vice versa. Updated information of products, customer relationship management, top management support, and adequate finance were also are found to be barriers to EC development for Vietnamese SMEs.

In addition, the analytical results revealed that some critical factors identify a certain EC adoption stage as distinction from other stages. For instance, perceived adequate support from government, lack of online customer management practices, and using many communication channels in adopting EC are the unique characteristics relating to SMEs in the advertisement stage, while the legal framework, support from technology vendors, and

adequate finance factors are seen as obstacles to their EC business. For the second adoption stage, the transaction stage, the unique characteristics are frequency of updating information about products/services, observability of success, and perceived providing better customer values; however, the group has problems in setting clear metrics for EC plans and non-useful support from government. SMEs at the most advanced stage, the intensive stage, have positive attitudes about the strength of legal frameworks, and the collaboration of IT and business staff in these enterprises results in smooth operations. These SMEs also can afford the cost of EC solutions, compared to SMEs in the lower EC adoption stages. In contrast, this group are facing some obstacles in EC activities such as updated information of products, logistics systems, and top management support.

6.11 Summary

Chapter 6 presented some descriptive information about characteristics of the sample of the main survey. In order to test the research models, some statistical procedures were performed. Principal component analysis was first conducted to examine the patterns of EC business activities deployed by SMEs. The results were analysed and compared with the theoretical evidence and scale characteristics. An EC adoption index was generated to compare the maturity levels of EC adoption. This index enabled the EC adoption by SMEs to be classified into three distinct groups. ANOVA was performed to examine what factors have an impact on the EC adoption groups. The transacting adoption group, in general, is more satisfied with employing EC activities than the advertising and intensive groups. The results obtained showed statistically significant observations in benefit gained in the transacting and advertising adoption groups. Interestingly, there was no noticeable observation among the transacting and intensive groups.

In order to explore CSFs, a non-parametric correlation analysis was also conducted between the EC benefit gained variable and entrepreneurial, technological, organisational, and environmental factors in each stage of EC adoption. There are many factors that have a strong impact on the benefits received in the transacting and intensive groups. These CSFs were then checked against various characteristics of SMEs, like age, ownership, and size. The results revealed that proprietary enterprises are less active than other legal status enterprises. The data analysis also showed that EC activities of micro enterprises are relatively passive in comparison to small and medium enterprises. This situation is seen among the intensive and transacting groups. Experienced enterprises were found to be employing more intensive CSFs than their counterparts in the younger enterprises.

A descriptive analysis was performed to identify specific barriers when Vietnamese SMEs engage in EC activities. A majority of the barriers related to specific characteristics of business environments, followed by obstacles relating to SMEs' non-ability to adopt EC. These barriers were also identified to be correlated to context-specific characteristics of Vietnamese SMEs. ANOVA results showed that only a few barriers were identified to be significant between private and proprietary enterprises. Micro enterprises were found to be faced with complex problems when adopting EC in comparison to small and medium enterprises. Again, start-up or new enterprises seem to encounter more problems when employing EC than experienced enterprises.

Finally, four logistic-based models were employed to identify critical factors that determine the development of EC and the features relating to SMEs in a certain adoption stage. These models provided some key factors that distinguished the low and high EC adoptions at a given stage to the other stages, including collaboration of staff, observability of success practices, aadequate finance, updated information of product, customer relationship management practices, legal frameworks, cost of EC solutions, expert availability, and communication channels.

The patterns of B2C EC adoption in Vietnamese SMEs have been provided in this chapter. The discussion of the results that explain specific characteristics of Vietnamese SMEs' EC adoption are discussed further in Chapter 7.