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**STIRLING**

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**The Adoption of E-commerce in SMEs: An  
Empirical Investigation in Egypt**

By

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

They said, "Exalted are you; we have no knowledge except what You have taught us. Indeed, it is You who is the Knowing, the Wise.

{Al-Baqarah; 32}

## **Abstract**

### **The Adoption of E-commerce in SMEs: An Empirical Investigation in Egypt**

It is recognised widely that e-commerce can offer substantial opportunities for Small and Medium sized Enterprises (SMEs) to compete in the global market. In developing countries, e-commerce opportunities can be a meaningful approach for SMEs to be able to compete with large businesses and to access, with lowest possible costs, international markets. However, the current situation shows that SMEs continue to lag behind in maximising their capabilities in taking these chances. Universally, they are reported to be slow adopters of new technologies as a result of limited financial resources and lack of expertise. The importance, of SMEs, emerged from their positions since they contributed more than 90% to many developed or developing countries' economies and they were considered to be the backbone of any economy.

Hence, the main purpose, of conducting this research, was to increase the body of knowledge about the process of the adoption of e-commerce. This was done by a primary empirical focus on small and medium sized enterprises (SMEs) in Egypt. SMEs represented about 90% of all Egyptian businesses (ITP, 2012). This study aimed to investigate the factors which could influence the SMEs' adoption of e-commerce. In order to accomplish this objective, the researcher investigated the previous studies, on the same approach, in order to identify the gap, within the literature, regarding the adoption of e-commerce amongst SMEs. Additionally, the researcher integrated existing theories on the adoption of innovation in order to develop a conceptual framework for the determinants of the adoption of e-commerce in the SMEs sector.

The researcher reviewed the Diffusion of Innovation (DOI); Resource Based View of the Firm (RBV); Technology–Organization–Environment (TOE) Model; and Technology Acceptance Models (TAM) to give constructive information about the firm and decision makers, within the firm, who were believed to have an impact on the adoption of innovation.

The proposed model was tested using quantitative research data. The data was collected by means of an online questionnaire survey and, subsequently, due to the high rate of non-respondents, changed to a face-to-face survey. A total of 130 usable responses were generated for purpose of analysis.

The study contributed to the existing research by providing valuable information about the factors which influenced the SMEs' adoption of e-commerce. As the results showed, there were 6 groups of factors which impacted mainly on the adoption processes. Namely, these were: Decision maker characteristics (education level, position within the firm, management support, management attitude); organisational characteristics (firm activity, firm size, firm's assets/capital, firm age, employee's IT knowledge, firm marketing capability); innovation characteristics (Perceived Relative Advantage); e-readiness (Individual and organisation e-readiness); government support; and barriers to e-commerce.

This study's findings offered important information for Egyptian government, policy makers and managerial participants; those were the people who encouraged the Egyptian SMEs to adopt e-commerce. These findings could be generalised to be applied to other countries with similar conditions to Egypt, as well as being applicable to Egyptian SMEs in other sectors.

Keywords:

E-Commerce, B2B, SMEs, Adoption, Diffusion, IT Usage

# **DEDICATION**

To My Mum and Dad

For love that is never exhausted by the time

For endless Kindness and no obstacle can stand in its way

**To My Wife**

For her sentimental Love and Endless Support

**To My sons**

For Inspiration to Achieve Greatness

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# **Chapter One**

## **Introduction to The Research**

## **1.0 Introduction**

This thesis examines the SMEs' adoption of B2B e-commerce. Most previous studies, about the adoption of B2B e-commerce, were conducted in developed countries (Molla and Licker, 2005). Therefore, this study focused especially on Egypt as a representative case for developing countries. This chapter provides an overview of the importance of B2B e-commerce; the study's purpose through stating the study problem; and the design of this research. This chapter presents, also, background information about the region in which the study was conducted.

### **1.1 Research Background and Its Importance**

B2B e-commerce originally offered a revolutionary difference in the way in which enterprises trade with one another. Additionally, B2B e-commerce implementations were encouraged as tools which would enable enterprises, in developing countries, to lower their costs significantly by facilitating their access to global markets. The Internet afforded an open global network and Internet-based businesses ought to improve businesses activities, in developing countries, by gaining more information about international markets and having direct access to new customers. The importance of B2B e-commerce will differ depending on competitive environment that a company faces (Kaplan and Sawhney, 2000). SME must identify the created value and the required effort for the implementation, before making any investment in B2B e-commerce (Luckling-Reiley and Spulber, 2001). B2B e-commerce also provides a procedure by which a business can move its demand across suppliers derived from available capability (Phillips and Meeker, 2000). B2B e-commerce can also provide substantial value across better market efficiencies by decreasing prices in industries where large numbers of buyers/sellers can be involved to the online marketplace (Chopra et al,

2001). As a result, of the importance of the Internet and its ability to facilitate businesses activities, now, most Small and Medium-sized Enterprises (SMEs) had their own access to the web. Latest published statistics showed that, nowadays, 79 % of UK firms had a web site, with 22 % of them having the capability of ordering goods and booking services online (European Commission, 2011). Fillis et al. (2004) stated that, despite the propaganda on e-commerce and the potential benefits which could be offered to the business, a significant number of SMEs had not utilised this new technology in carrying out their business. It was observed that the latest IT developments were improving and, in the near future, would continue to improve the business environment (Palvia, 1997).

In the last decade, SMEs' role had become significantly important and, over the years, had increased progressively since, particularly in developing countries, they were considered to be the backbone of many countries' economies.

As stated by the European Commission Enterprise and Industry, there were 21 million SMEs, in the EU, by the end of 2010. This represented 92% of all EU enterprises and, actually, nine out of ten SMEs were micro organisations with less than 10 members. They were a key driver for employment, innovation and economic growth (Wymenga et al., 2011). Therefore, in order to allow them to reorganise their comprehensive potential in today's global market, it was significantly important to enhance the role of SMEs to improve the business environment and to stimulate entrepreneurship. Mostly, in comparison to large businesses, SMEs were deemed to be flexible and innovative and these attributes made them a good fit to adopt e-commerce (Lertwongsatien, Wongpinunwatana, 2004; Lefebvre et al., 2005).

SMEs utilise B2B e-commerce technologies in different ways, involving: collecting market information; affording more information about products and services; communicating with

customers and suppliers; and offering after sales support (Doherty and Ellis-Chadwick 2003). Moreover, the adopting of B2B e-commerce assisted SMEs to improve their proficiency and competitive position on the trading floor (Bertschek and Fryges, 2002).

Many studies (Daniel et al., 2002; Jeffcoate et al., 2002; Gibbs, 2003; Limthongchai and Speece, 2003) indicated, generally, that, as a result of their limited resources, SMEs were slow to adopt e-commerce. (Purao and Cambell, 1998; Kshetri, 2007) stated that some of the most common factors, which could slow down the SMEs' adoption of B2B e-commerce, were: a shortage of financial abilities; a lack of technology literacy; poor communication infrastructures; and the absence of business laws for e-commerce. Consequently, the SMEs' adoption of e-commerce might be different to the large businesses' adoption of these innovation technologies (Molla and Licker, 2004). In developing countries, the SMEs' situation, concerning the adoption of technology, was still far behind SMEs in developed countries (Kartiwi 2006).

Most developing countries were weak in developing technology; they lagged behind as a result of high illiteracy rates; low levels of income; cultural resistance; and the poverty of development strategies (Choe, 1986, Malecki, 1997; Heeks, 2002). It was important to understand that building telecommunications infrastructure was far expensive due to the developing countries' capabilities and required financial support from different resources such as a developed country (UNCTAD, 2004). Also, SMEs needed to adopt new strategies of planning; to modify their management processes; and to change their business culture in order to be able to cope with the new technologies motivations (Knight, 2001).

Hence, from what was mentioned above, there was increased importance in conducting this research since many studies had investigated the adoption of innovation in different instances. However, most, of these studies, focused on the context of the different approaches to adoption from an individual standpoint especially in utilising the Diffusion of Innovation Theory (DOI) (Rogers, 1983). With the increase of technology awareness more studies tried to examine the adoption of technology by using Technology Acceptance Models (TAM) (Davis et al, 1988). Generally, these studies concentrated on individual consumers' concerns towards accepting new technology (Pavlou, 2003; Bruner and Kuma, 2005) and some focused on B2C approaches (Anderson, Schwager, 2004).

Therefore, by adopting a B2B approach, this study looked to provide a new contribution towards the current body of knowledge on the Egyptian SMEs' adoption of e-commerce. This was done by investigating, in this regard, existing theories and models and creating a conceptual framework which could identify the factors which could influence the adoption of e-commerce and could be applied in the Egyptian environment. Additionally, studying Egypt, as an example of a developing country, was considered to be beneficial in adding to the technological adoption studies which had concentrated mainly on developed countries.

## **1.2 Research Problem**

The majority of the studies, about the adoption of e-commerce, studies focused predominantly on developed countries and very little on developing countries (Molla and Licker, 2005). These researches concentrated mainly on the adoption from an individual approach with more investigation on B2C contexts. It was believed widely that the factors, which could impact on the adoption of e-commerce in developed countries, could be different from those which influenced the adoption approach in developing countries. These were as a

result of the differentiation in culture and education; income levels; the readiness of the infrastructure and levels of government support.

Although the Egyptian government had introduced some processes and programs to promote the adoption of e-commerce and especially with the organisational approach, few researches investigated the adoption of e-commerce and such studies focused on individual consumers.

Hence, to the best of the researcher's knowledge, because there was no previous empirical work, in Egypt, on the adoption of B2B e-commerce, this study was considered to be the first Egyptian research to be performed on this approach.

### **1.3 Research Questions**

This study aimed to answer the following questions:

- 1- What was the present situation of B2B e-commerce in Egypt?
- 2- What was the current level of B2B e-commerce practice amongst Egyptian SMEs?
- 3- What, amongst Egyptian SMEs, were the significant factors which could influence the adoption of B2B e-commerce?

### **1.4 Research Objectives**

This study's main motivation was to highlight the knowledge of understanding regarding the SMEs' adoption of e-commerce and to develop a measure which could characterise the adoption of B2B e-commerce and, in particular, the adoption of B2B e-commerce amongst Egyptian SMEs. In investigating, empirically, the adoption of e-commerce, the study's main objectives were:

- 1- To discuss critically e-commerce concepts and previous research on the Internet and e-commerce.
- 2- To discuss critically the SMEs' adoption of innovation and any other related disciplines.
- 3- To identify the gap with previous studies, and, in relation to the implementation of B2B e-commerce in the context of SMEs, to investigate current research,.
- 4- To construct and develop a theoretical framework for the adoption of B2B e-commerce within the context of SMEs.
- 5- To investigate the practical factors which might influence whether or not the Egyptian SMEs adopted B2B e-commerce.
- 6- To suggest the generalization of the results and offer any recommendations on different directions which might prompt the adoption of B2B e-commerce.

## **1.5 Background to Egypt**

Egypt was considered to be the most important country in the Middle East and Africa with 5000 years of civilisation contributing to the country's cultural heritage. It had a very important location in north east Africa with control of the Suez Canal which regulated 40% of the world's shipping traffic and controlled 10% of the world's trade movements. Egypt was the 29th biggest country in the world, with 1,002,450 sq. km land space and with 29 independent administrative units (governorates) from Kafr el-Sheikh in the north to Aswan in the south and from Sinai in the East to Alexandria and Matrouh in the West and Cairo being the country's capital (CAPMAS, 2012). Egypt's economy depended mainly on exports of natural gas; Suez Canal; petroleum exports; agriculture; media; and tourism. There were no official statistics of the number of SMEs in the country; however, the Ministry of Industry and Foreign Trade announced that SMEs contributed about 90% of Egyptian business (ITP, 2012). The International Monetary Fund annual report ranked Egypt as one of the top countries in the world undertaking economic reforms (Klaus, 2011).

## **1.6 Structure of the Thesis**

This thesis consists of eight chapters. There is a discussion of the manner of these in achieving this study's objectives and these are outlined as follows (figure 1:1).

The first chapter is the introduction. This chapter outlines the background and the importance of this research; it states the study problem to be investigated; the research questions and objectives; and the background to Egypt.

The second and third chapters review the literature. The second chapter reviews the literature on the Internet and e-commerce. There is a discussion on the use of the Internet with a special focus on the Internet's status in developed and developing countries. The concepts of e-commerce and its history are highlighted with a focus on the differences between traditional trade and e-commerce. There is further discussion about the growth of e-commerce in developed and developing countries and, in particular, in the Egyptian context in the Middle East. There are explanations and examples of the most common types of e-commerce: Business to Consumer (B2C); Business to Business (B2B).

The third chapter reviews the literature on SMEs' adoption of innovation. It discusses the concept of SME and how it was identified in different countries around the world. The diffusion of innovation and the adoption of e-commerce are reviewed and the decision making process, in SMEs, is highlighted. These detailed reviews are based on studies conducted in developed and developing countries, as well as the individual and organisational approaches. These studies are reviewed critically and a summary given of the main factors which impacted on the adoption of innovation. Also, there is an identification of the gaps in

the literature concerning the adoption of e-commerce and there is a direction on the areas which need to be covered in order to fill these gaps.

The fourth chapter discusses the most common theories and models which were utilised in the context of adoption of innovation and, especially, technological innovations. The Diffusion Of Innovation (DOI), Resource-Based View of the firm (RBV), Technology–Organization–Environment (TOE) Model; and Technology Acceptance Models (TAM) are reviewed critically with a special focus on the identified gaps to formulate the proposed conceptual model which was utilised to investigate the factors which could influence the SMEs' adoption of e-commerce. The researcher developed, also, research hypotheses in order to examine the validity of the proposed model.

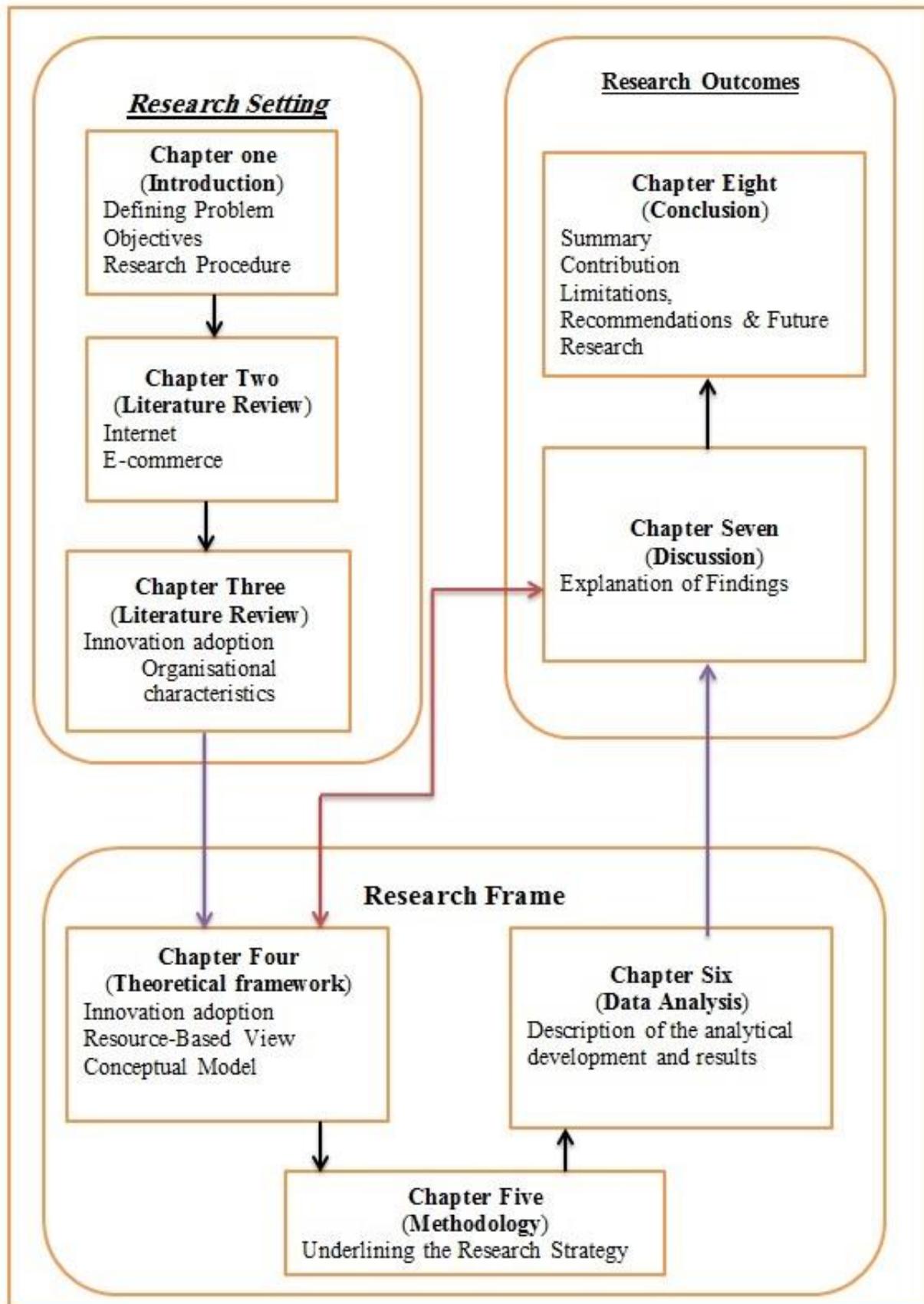
The fifth chapter discusses the research methodology adopted in this research and the reasons for adopting it. The chapter starts with a discussion on defining the research methodology with some focus on each context and the identified differences between them. It discusses, also, the chosen data collection method and the reasons for choosing it.

The sixth chapter discusses the analyses of the collected data. The chapter starts with the descriptive analysis through providing the profile of the respondents who were the SMEs' CEO/top management since, in these firms; they were the decision makers and were responsible mainly for the adoption decision. It discusses, also, the profiles, of responding SMEs, along with the orphaned results. Then, the chapter explains the outcomes from deductive statistical testing of the results.

The seventh chapter presents the main findings from testing the study's hypotheses in comparison to the previous studies discussed in literature review (chapters 2&3). This chapter starts by reviewing the analysis of the approach. It discusses, also, the level of adoption of e-commerce and identifies the Egyptian SMEs' situation in this process.

Chapter eight provides a summary of the research's main findings by discussing the research theoretical and practical contributions. It outlines, also, the research's limitations; makes recommendations for governments and companies to help with the adoption of e-commerce. It discusses, also, the suggestions for future areas of research.

**Figure 1.1: Summary Illustration of the Thesis' Contents**



# **Chapter Two**

## **Internet and E-commerce**

## **2.0 The Introduction**

This chapter investigates the Literature Review of Internet and Electronic Commerce. The world has witnessed, in recent times, an increasing attention to e-commerce as an inevitable and necessary modern development tool in the field of information and communication technology. Against this background, the World Wide Web played an important role as a mediator in completing the implementation of the modern form of trade. It became one of the pillars of the new global economic system. The global economy system heralded a huge shift from the traditional form of trade to modern electronic format e-commerce. This has become a tangible reality in the current environment. Many countries and economic coalitions focused on how to maximize the role of electronic commerce. This was especially so under the global changes and new challenges which were expected to magnify, in the near future, the role of e-commerce role due to the impact of trade, on these markets, and corporate performance and competitiveness. It was expected that during this century and in all parts of the world, electronic commerce would be the prevailing way of trade between organizations and individuals.

## **2.1 Internet Backdrop**

The Internet was considered to be one of the most important contemporary tools and techniques which contributed to the dissemination of knowledge all over the world and the most important way to share experiences, knowledge; diffusion of culture; and build communication bridges between different countries. The Internet has become a major channel for businesses especially in the developed world. E-commerce has become significantly an important channel which could be utilised through the Internet.

### **2.1.1 History of the Internet**

The Internet started in 1969 as an experimental project at The Advanced Research Projects Agency (ARPA) of the USA Ministry of Defense. This network was called Advanced Research Projects Agency Net (ARPANET) and it was connected to the U.S. Ministry of Defense computers. ARPANET's main target was to find a system which could connect a group of PCs in different places and could resist any attack. Once one or more PCS were destroyed, the rest could continue working without loss of performance or information. In 1970, the Internet started to be used by universities conducting military researches in cooperation with ARPANET until it reached 100 websites in 1975 (Cate, 1997, p.22). In 1980, US National Science Foundation (NSF) separated from the U.S. Ministry of Defense to form its own network (NSFNET). In the same year, two new networks (USENET & BITNET) were launched and these represented the first step to providing the public with information technology (Lynch and Lundquis, 1996, p.5). In 1991, NSF decided to offer the network to commercial businesses (Frost and Strauss, 2000, p.6). The main reason, for offering it commercially, was an attempt to secure financial support for future development of the network (Cate, 1997, p.23). After a wide spread of the three networks (USENET & BITNET, NSFNET) and the appearance of some new commercial networks like Compu Serve and America On-line, all were integrated together and formed what we know nowadays as the Internet (Spinelli, 1997, p.7).

### **2.1.2 Use of the Internet**

The Internet, as a technology, expanded into a communication channel so large and powerful that it could not go unnoticed (Curtis and Cobham, 2008). In 1999, Matrix Information and Directory Services (MIDS) reported that the number of internet users has increased from 57

million people in 1997 to 120 million in 1999 This meant that, in less than 2 years, the number of internet users, all over the world, had increased by more than 100% (Skok, 2000). Tan and Ouyang (2004) mentioned that, in 2002, there were more than 340 million internet users which increased to 591 million users by the end of 2002 (UNCTAD, 2003). By the end of 2012, Internet World State (2012) estimated that the number of worldwide Internet users would reach around 2.5 billion user.

**Table 2.1 History of Internet users**

World Regions	Population (2012 Est.)	Internet Users Latest Data	Penetration (% Population)	Users % of World	Growth 2000-2012
<b>Africa</b>	1,073,380,925	<b>167,335,676</b>	15.6 %	7.0 %	3,606.7 %
<b>Asia</b>	3,922,066,987	<b>1,076,681,059</b>	27.5 %	44.8 %	841.9 %
<b>Europe</b>	820,918,446	<b>518,512,109</b>	63.2 %	21.5 %	393.4 %
<b>Middle East</b>	223,608,203	<b>90,000,455</b>	40.2 %	3.7 %	2,639.9 %
<b>North America</b>	348,280,154	<b>273,785,413</b>	78.6 %	11.4 %	153.3 %
<b>Latin America/ Caribbean</b>	593,688,638	<b>254,915,745</b>	42.9 %	10.6 %	1,310.8 %
<b>Australia/ Oceania</b>	35,903,569	<b>24,287,919</b>	67.6 %	1.0 %	218.7 %
<b>World Total</b>	<b>7,017,846,922</b>	<b>2,405,518,376</b>	<b>34.3 %</b>	<b>100.0 %</b>	<b>566.4 %</b>

(Source: www.Internetworldstats.com, 2012)

### 2.1.3 Internet in Developed Countries

In fact, the Internet facilitated renewed Western economic domination through controlling the capital of information capital which was the lifeblood of the new information-based industries (Noble, 1998). These advantages stimulated the technology businesses to internationalise the new instrument, expanding its reach to more than 1.24 billion

international users within less than fifteen years (Internet World Stats, 2007; Albirini, 2008). The Internet contributed considerably to increasing economic and industrial activities not only in developed countries but, also, in developing countries (Petrazzini and Kibati, 1999). The Internet was invented mainly in the U.S.A.; and expanded on its initiative; and the majority of flowed Internet contents originated widely from America (Greenstein, 2004). Moreover, the USA was the leader in developing and using computers in universities; industry; government; and the military. The prompt adoption and large Internet installations created positive feedback and reinforcing the American advantage. (Flamm, 1988, p.28). According to Internet World Statistics (2012), more than half of the population of Europe population were Internet users (63.2%) and approximately less than third (10.2 %) of that number were UK users. On the other hand, Asia; and China and Japan had the majority participation on Internet users on the whole continent (50% 9.4 %) respectively. Finally, North America was currently the front runner in Internet usage but, now after a slow start, Asia was showing great interest too, In Europe, the UK was the most advanced Internet user; however, generally, the region appeared to struggle to embrace the new technology (Smith and Jenner, 1998).

#### **2.1.4 Internet in Developing Countries**

The five decades, which followed the end of World War II, were perceived to be a period when Western powers drove strongly to spread mass media as a way of enhancing development efforts in developing countries (Fagerlind & Saha, 1989). In such countries, technology businesses took the lead role in the diffusion of the Internet. These businesses offered various motivations and, in Africa, Asia and Latin America, introduced several projects to ensure their connectivity to the rest of the world (Bu-Hulaiga, 2001). As shown in Table 2.1, the number of Internet users, in developing countries, continued to experience

faster growth than developed countries. Between 2000 and 2012, Africa and Middle Eastern countries showed the highest growth rate (3606.7 % & 2639.9 %) of Internet users. One issue, relating to the deficient use of the Internet in developing countries, was the limitation of International bandwidth. International bandwidth availability was important for developing countries because a large part of Internet traffic, in developing countries, tended to be international, and there was the relative scarcity of a locally-generated substance (Kamel, 2006). The Internet's diffusion, in developing countries was linked with promises of economic development opportunities; helpful social change; and political participation chances for marginalised groups (Wheeler, 2004). Moreover, in most developing countries, the implementation of the Internet brought enormous economic profits to the predominantly Western technology industries and strengthened the dependency relationship between the Western economic system and its counterparts in developing countries (Harvey, 1983). However, most Middle East eye witnesses agreed with a United Nations report on this subject: "Despite the costs of using ICT to its infrastructures are high, but also the costs of not doing so are likely to be much higher" (Mansell and Wehn, 1998, p.20). Lastly, the economics, of the Internet approach were critical to the issue of limited usage in developing countries.

### **2.1.5 Internet in Egypt**

With the emergence of the Arab revolutions, Internet access, in Egypt, was becoming increasingly more popular,. Gaining access to the Internet, through a dial-up connection, was believed to be one of the cheapest and most popular means of connecting to the Internet (Young, 1999). The first Internet connection, which of appeared, in Egypt, was in 1993. It started with a cable connection from France to the Egyptian Universities Network (EUN) and the National telephone organization (predecessor of Telecom Egypt) with the Cabinet

Information and Decision Support Centre (IDSC). At that time, there were estimated to be less than 5,000 Internet users (MCIT, 2010, p. 14). In 1994, the Egyptian domain (.eg) was divided into 3 sub domains: .sci.eg serving the scientific research institutes; .gov.eg for Governmental bodies; and .eun.eg for the Egyptian Universities Network. In 1996, the user numbers increased to 20,000 users in line with the change of gateway speeds which increased by approximately 20 times (MCIT, 2010, p. 15-16). In 2000, the Integrated Services Digital Network (ISDN) was introduced in Egypt. It converted the normal Analog and slow telephone lines to Digital fast ones with available speeds at 64kbps and 128kbps (MCIT, 2002, p. 19). Along with the implementation of Digital subscriber line (DSL) technology in Egypt, many businesses and users changed their subscriptions to utilise the high speed new service. The country's Internet services were controlled mainly by four class A companies (Link Egypt; TEdata; Egy Net; and Nile online) which had the license to set up; manage; and operate the core infrastructure in offering Internet services to the second class (B) companies. This eight class B companies had the right to set up; manage; and operate, without voice telephony services, the necessary core for the transfer of local and international data. Class B distributed this licence to class C (212 companies) to offer free internet services at the same tariff of fixed telephony calls (MCIT, 2009). Today, many Internet service providers (ISP) provide customers with services at speeds of up to 24Mbps at a price of 1950 Egyptian Pound/month (£1= 10 LE, 2012) ([www.Tedata.net/eg](http://www.Tedata.net/eg), 2012). In 2008, Egypt's spending, on ICT, reached about US\$ 10 billion and was expected to increase to US\$15 billion by 2013 (MCIT, 2010). The number of Internet users, in Egypt, increased from 24 million, in 2010, to about 30 million users by the end of 2012 with about 5million more users in the next two years. This might explain the major effect of the Egyptian revolution, on 25 January 2010 and the Internet's important role in this revolution. The estimated number of Internet users represented an annual increase of 6.75 million users and

an annual growth rate of 27.96%, since, compared to 24.15 million at the end of 2011, this number had increased to 29.80 million by the middle of 2012, (ICTIB, 2012).

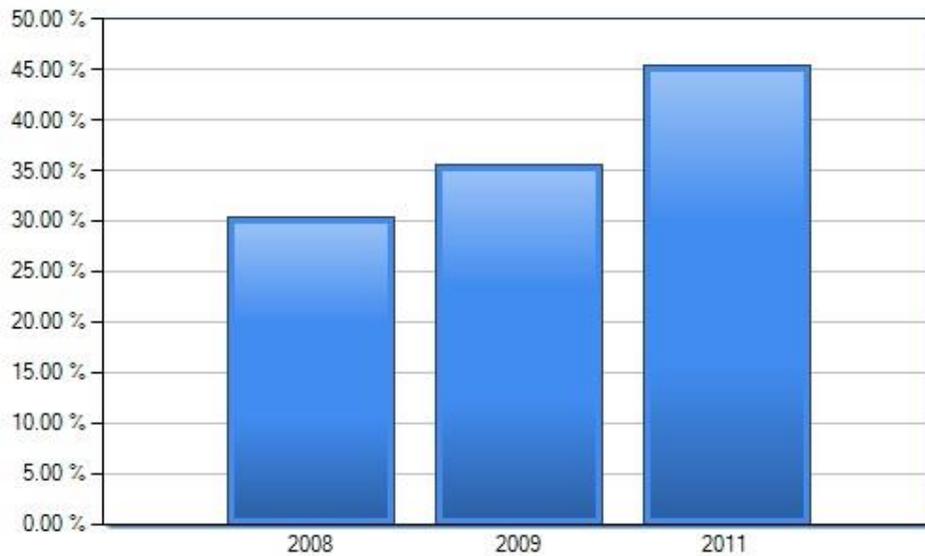
**Table 2.2 History of Egyptian Internet users**

AFRICA	Population (2012 Est.)	Internet Users Dec/2000	Internet Users 30-June-2012	Penetration (% Population)	Internet % Africa
EGYPT	83,688,164	450,000	<b>29,809,724</b>	35.6 %	17.8 %

(Source: www.Internetworldstats.com, 2012)

According to world Internet statistics, Egypt is the second largest country of Internet users (17.8%) in Africa after Nigeria (28.9 %) which is the largest country of Internet users (Table 2.2). At the same level in the Middle East region, Egypt is the second largest country of Internet users (24.9%) after Iran with 46.7% of the Internet users in the whole region. However, in the Arab countries, Egypt was considered to be the first country of Internet users only less than half of the businesses, in Egypt, used the Internet (Figure 2.1).

**Figure 2.1 Proportion of businesses using the Internet.**



(Source: [www.new.egyptictindicators.gov.eg](http://www.new.egyptictindicators.gov.eg), 2012).

This might reflect the level of internet penetration, in Egypt, and the level of Internet services provided to individuals and, also, to the business industry.

## **2.2 Background to E-commerce**

Electronic commerce was one of the new, unpredictable global variables which imposed itself dynamically during the latter part of the twentieth century. Then, it became one of the pillars of the new global economic system. This kind of trade depended mainly on the use of the latest information and communication technologies in expanding the range of the world market east to west and across continents of the world.

### **2.2.1 What is E-commerce?**

Due to e-commerce's virtual young life and its complexity of, there was no single agreed definition of what was meant by this expression. E-commerce was a method of interacting and exchanging a wide range of products and services (Samiee, 2008). Whilst the New Oxford Dictionary of English defined e-commerce as: 'The activity of buying and selling, especially on a large scale'. E-commerce could have a broad or a narrow definition. Zwass (1998) defined it as a distribution of business information; upholding business relationships; and performing business transactions by means of telecommunications networks. More significantly, e-commerce transactions were the exchanging of goods and services using the internet and other digital media (Chaffey et al, 2000). In addition, the adoption of e-commerce was an illustration of IT acceptance and practice within a setting which combined the adoption of technology with the rudiments of marketing. Therefore, within the information systems literature, it required distinct theorization (Pavlou and Fygenson, 2006). There was another definition for e-commerce actions as commercial activities such as the buying and selling of products and services; and the transfer of funds through public or private digital networks, conducted electronically (Shen et al,2002). Whilst another e-commerce definition was that it aimed to exchange information and execute transactions amongst enterprises and individuals (Kanungo, 2004). However, Kalakota and Whinston (1996) defined e-commerce based on the following:

- From a communications perspective: E-commerce was the delivery of information; products/services or payments via telephone lines, computer networks, or any other means.
- From a business process perspective: E-commerce was the application of technology towards the mechanisation of business transactions and workflow.

- From a service perspective: E-commerce was a tool which directed the desire of firms; consumers; and management to cut service costs, whilst improving the quality of goods and increasing the speed of the delivery service.
- From an online perspective: E-commerce provided the competence of buying and selling products and information on the Internet and other online services. Therefore, it could be said that e-commerce was an action of a trust action, between buyers and sellers, in buying and selling goods or services and paying by many types of digital payments.

### **2.2.2 The History of E-commerce**

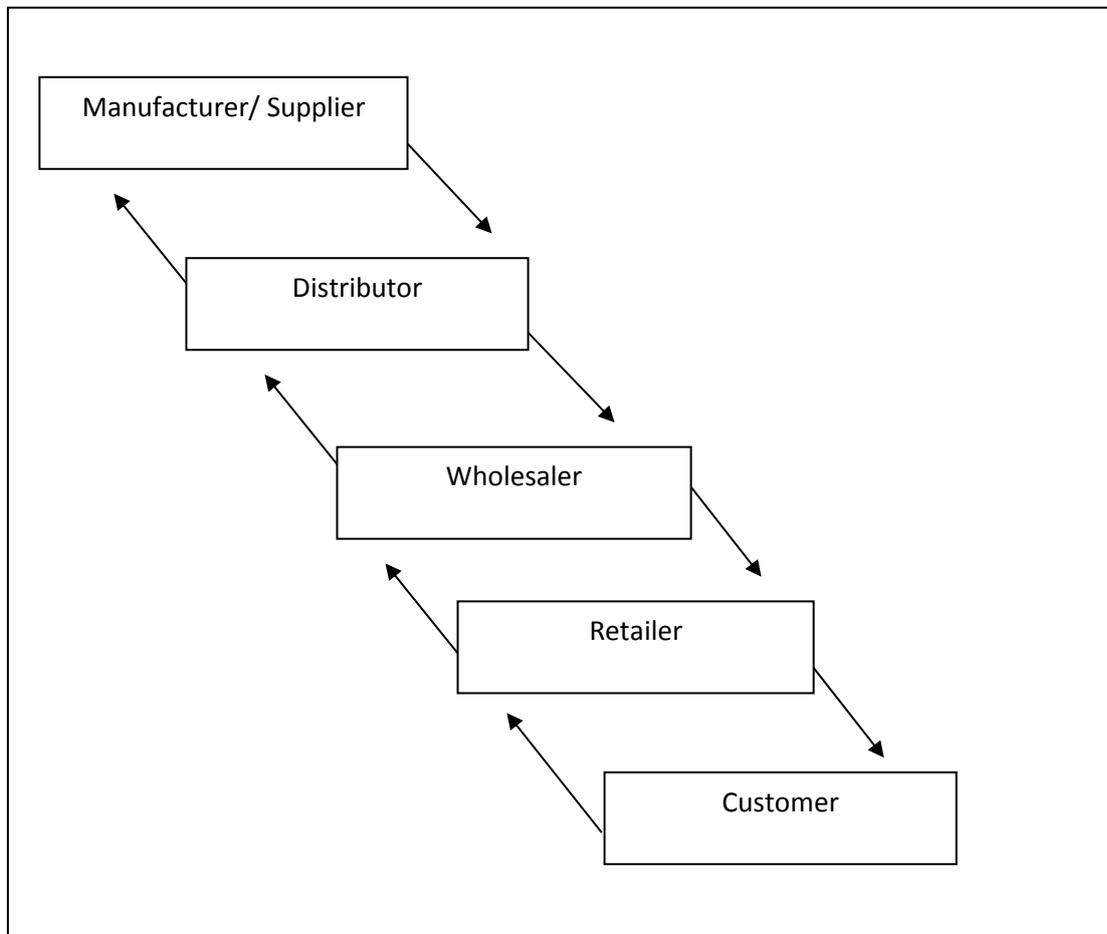
E-commerce emerged long time ago and it had many forms. At that time, TV Home shopping was the most famous form but was unknown as an e-commerce until the Internet appeared and was used to practice e-commerce (House and Siebel, 1999, p28). Before we go further about the history of e-commerce history, we need to differentiate between traditional commerce and e-commerce. Then, we consider the Internet initiative.

#### **2.2.2.1 Traditional Commerce**

This part of trade was characterised by having many channel which the product/services went through before it arrived at the final customer. As shown in Figure 2.1, the product/services moved from manufacturer or supplier to the distributor who sold it to the wholesaler or retailer and, then, they sold it to the final customer. During these processes every broker added the cost and profit margin to the price of the product/services and, by the end, the price was higher than the original price identified by the manufacturer/supplier. Also,

it took a long time due to transportation and distribution from one channel to another (Korper and Ellis, 2000, p13-14).

**Figure 2.2: Traditional Selling Chain**



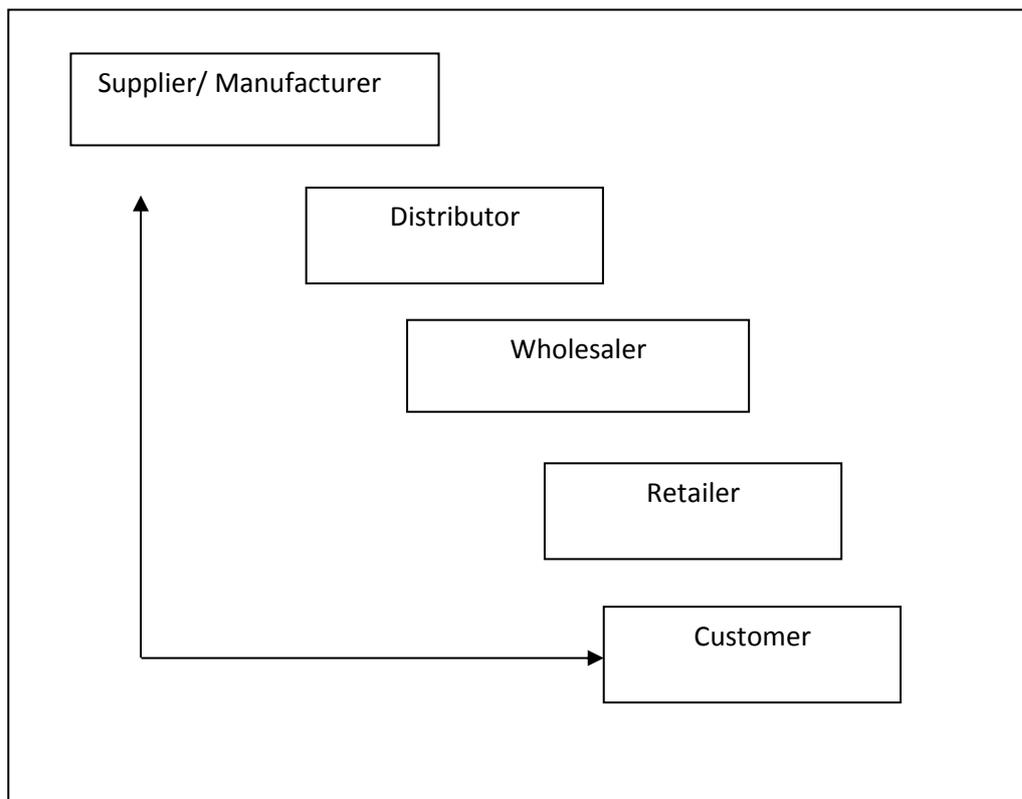
Source: Korper and Ellis, 2000, p13

### **2.2.2.2 E-commerce**

E-commerce evolved the direct marketing sale since it reduced the transmitted channels which the product/services passed through from manufacturer/supplier to the final customer (figure 2.2). Unlike traditional selling, the use of e-commerce, in selling, meant that the product/services could move directly from the manufacturer/supplier to final customer

without passing through other brokers. E-commerce saved the time between the production and the consumption of product/services. Also, there was a cost saving because it reduced transportation/distribution processes between brokers. Consequently, e-commerce reduced the price of the product/service and improved its diffusion by communicating directly with the final customer.

**Figure 2.3: E-commerce selling chain**



(Source: Korper and Ellis 2000, p14-15).

In the few years after it began in 1995, e-commerce, in the USA, grew from around \$95 billion, from retail businesses, to \$1.2 trillion from business-to-business in 2003. It was projected that, in the next five years, e-commerce would continue to grow at double-digit rates, becoming the fastest growing form of commerce in the world. This was similar to the electronics industry in the twenty-first century.

### **2.2.3 The Growth of E-commerce in Developed Countries**

Developed countries, offering e-commerce, showed remarkable improvement in their respective economies (Javalgi et al., 2005; Elbeltagi, 2007). Despite a great percentage of on-line transaction contributed by developed countries like the USA, UK; Japan; Canada; France; Italy; and Germany, and by advanced developing countries like South Korea; Brazil; China; India; Malaysia; Taiwan; Thailand; and Singapore, other developing countries were moving gradually into Internet based markets with a significant influence (UNCTAD, 2004; Shareef et al 2008). The first e-commerce software provider opened its office in March 1988 in Toronto, Canada (Business Editors, 1998). A report, by the US Commerce Department, noted that, whereas internet traffic was 100 million worldwide by the end of 1997, a billion people were predicted to log on by 2005 (Ingersoll, 1998). Forrester Research, a respected research firm, expected that on-line business to consumer sales would grow from 20.3 billion dollars in 1999 to 38.8 billion dollars by 2002 (Korper and Ellis, 2001). Consumer e-commerce was predicted to reach 380 billion dollars by 2003 (Dedhia, 2001). In the near future, business-to-business transaction volumes were expected to outstrip business-to-consumer transactions (Tiernan, 2000). The e-commerce implications, for of small businesses, in was evaluated by International Data Corporation to be over 4.3 million by 2001 (Kienan, 2000) and by Access Media International to be more than 5 million by 2002 (Tiernan, 2000). As announced by Forrester Research, 45 % of small companies; 85 % of medium size companies; and 98 % of large companies would take part in e-commerce in U.S in 2002 (Karagozoglou and Lindell, 2004). The US based Boston Consulting Group foretold that, by 2004, US business to business (B2B) e-commerce would develop from \$1.2 trillion this year to \$4.8 trillion in transaction value (Brown et al, 2001). As e-commerce took hold, in the retail sector, the readily growing e-commerce share of retail sales reached 2.8%, or about \$109 billion by 2006 (US Census Bureau, 2007). One of the most important

agreements on global e-commerce to stimulate the implementation of e-commerce and international trade between both sides, concluded by the United States of America, was the one with the European Union in December 2000 (Blythe et al., 2005).

#### **2.2.4 The Growth of E-commerce in Developing Countries**

There was a danger that the more developed economies were using e-commerce, as a tool, to control non-tariff barriers and gain access to the developing countries' protected service sectors (Palmer, 1999). In Venezuela, The International Telecommunications Union (ITU) signed a trust fund partnership agreement with the World Trade Centre and the World Internet Secure Key to fund e-commerce projects in developing countries. This agreement aimed to expand e-commerce in developing countries (EC-DC) by adding US\$2.7mn to the EC-DC fund every year for the next three years. The funds would be used to cover the costs of e-commerce infrastructure and solution implementation in developing and least developed countries (Business News Americas, 1999). Shareef et al. (2008) conducted a study on on-line purchase decision in developing countries. The study demonstrated that online buying decisions were influenced significantly by perceived customer care; understanding customer values; realising operational security; attention to site security; and discernible trustworthiness. Kinyanjui and McCormick (2002) found that, in developing countries, B2B e-commerce empowered firms to overcome the problems which they encountered in trading on the international market since it enabled developing countries' producers in to become more incorporated within the global economy. It was argued that because of the high cost of transportation and inefficient trade procedures, if the least developed countries adopted e-commerce, they could stimulate their positions by engaging in trade as a tool for development (UNCTAD, 2001). Moreover, Moodley (2001) found in a B2B study, in South Africa, that firms considered e-commerce to be an extra investment with more cost with uncertain overcomes. However, Paré (2003) regarded that, by reducing the transaction costs,

B2B e-commerce would enable producer firms, in developing countries, to sell their products/services more easily in international market. Consequently, for a developing country to gain the majority benefits of the diffusion of information and communication technologies (ICTs) especially in the application of e-commerce, it required a reduction in the cost of adopting technology and improving institutional arrangements to stimulate commercial activities and increase international trade (Mansell 2001a; Patterson and Wilson 2000).

### **2.2.5 E-commerce and Arab countries**

All countries, whether developed or developing countries, were affected by Information and Communications Technologies (ICTs). E-commerce was used commonly in all modern nations but, in the Middle East especially in Arab countries, it remained in the early stages since culture; politics; and ICT infrastructure played an important role in adopting and using global systems (Elbeltagi et al.,2005). E-commerce was new in the Arab region and consumer resistance could be weakened slowly but surely with appropriate information campaigns (Hallouda and Ghonaimy, 2000). The adoption level of e-commerce might be reflected by the lack of training in e-commerce related technologies and there was some need for customising technology, from abroad, for the Arab region (Warf and Vincent, 2007). Despite the difficulty of determining the volume of e-commerce in the Arab region, some studies and statistical researches showed an estimated volume of e-commerce in the Arab world. For example, NUAsoft web design's study indicated that Arab e-commerce activities increased from US\$26 billion in 1997 to US\$330 billion in 2001 with a growth rate of over 200% and was expected to reach US\$5000 billion by 2009 ([www.nua.ie/surveys/](http://www.nua.ie/surveys/), 2010). B2B e-commerce, in the Arab region, had not exceeded 0.7% of the world activity of business-to-business e-commerce (UNCTD, 2009). The low contribution of Arab e-commerce, on a global level, was due to several reasons. These included that the sites, using the Arabic

language, represented only 0.5% of space usage on the global Internet. This was considered to be the main inhibitor of e-marketing in the Arab world (Aladwani, 2003). The weakness of digital banking systems; low performance of technology infrastructure; absence of legislative and legal structures; and low level of trust towards e-commerce, were, also, important reasons which reflected the low level of e-commerce in the Middle East (Alrawi and Sabry, 2009).

### **2.2.6 E-commerce and Egypt**

After the Internet came to Egypt, in 1993, and in understanding the potential benefits from using the Internet, the Egyptian government, in 1996, started to provide the Internet to the Internet Services Providers (ISP) to set up and manage and transfer data for the Egyptian society (MCIT, 2010) until there became more than 220 ISPs in Egypt in 2012 (MCIT, 2012). These Internet campaigns helped to spread the Internet and understanding of what the Internet could do for individuals and businesses. Consequently, in 1998, the International Trade Point (ITP) was established in Egypt as a reference to a 1992 UNCTAD recommendation about setting up ITPs around the world to facilitate trade movement and e-commerce marketing between members of developing and developed countries. Egyptian ITP started to use the Internet to stimulate Egyptian exports by marketing Egyptian products/services and providing trade opportunities through international information networks. It introduced, also, promotion chances (export, import, investments opportunities) to Egyptian SMEs to stimulate their position as SMEs contributed about 90% of Egyptian business (ITP, 2012). At the same time, the Internet society of Egypt (ISE) established an Electronic Commerce Committee (ECC) to disseminate information and the definition of e-commerce to Egyptian society. It started, also, to give lectures and organised workshops, in the public and private sectors, to discuss the challenges and opportunities from adopting e-commerce (Internetsociety.org, 2012). Egypt was moving steadily towards a knowledge

based economy; this was noticeable through the establishment, in October 1999, of the Ministry of Communications and Information Technology (MCIT). There were many governmental initiatives to adopt ICT (Information and Communications Technology) at all levels in Egypt. The reality remained that the country was far behind and there continued to be a lot to be done by both the private sector and the government to maximise the necessary benefits (Elbeltagi, 2007). The 15th law of Egyptian electronic signature was announced in 2004; this managed official permission of e-signatures and established the information technology industry development authority (US Fed News, 2005). However, until now, this law remains inactivated due to many problems with the banking sector and the high cost of adopting e-signatures (Nawar, 2005).

## **2.3 E-commerce Types**

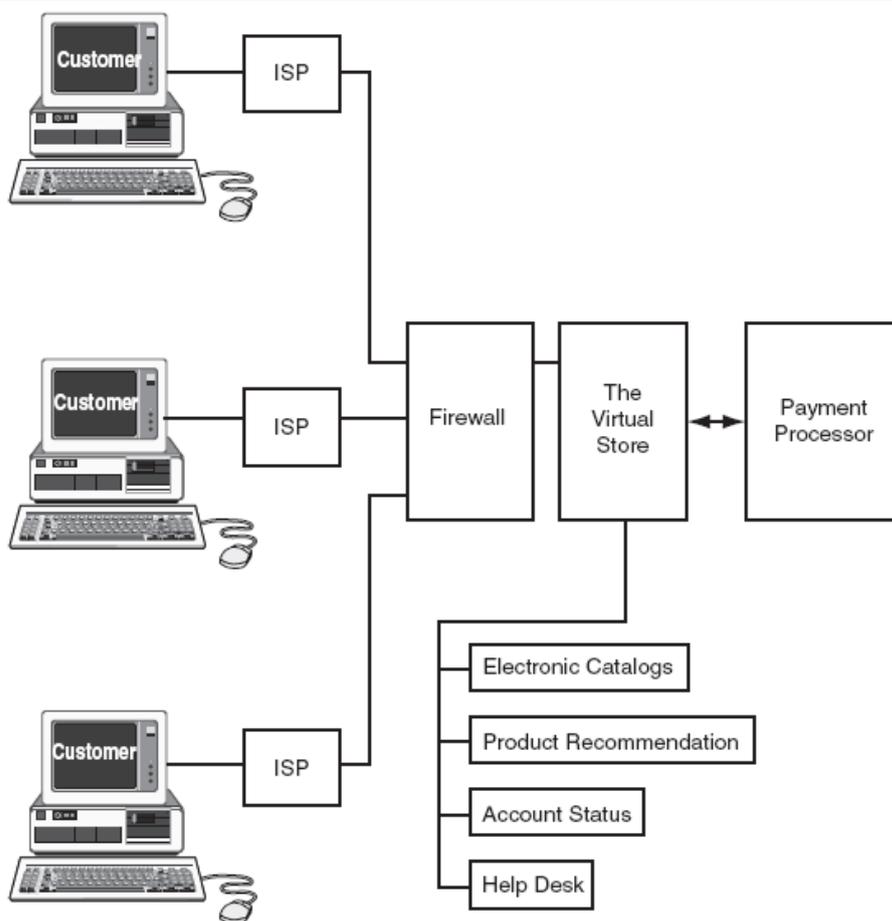
E-commerce could be classified in many ways. One was the nature of the participants in e-commerce transactions. There were 7 major e-commerce categories: Business to Consumer (B2C); Business to Business (B2B); Consumer to Consumer (C2C); Consumer to Business (C2B); Business to Government (B2G); Government to Government (G2G); and Government to Consumer (G2C) following sections will focus on B2C and B2B types.

### **2.3.1 Business to Consumer (B2C)**

B2C e-commerce was considered to be the most important type as a result of revenues it generated. In 2012, global B2C sales generated about US\$960 billion, and the USA achieved only US\$380.8 billion dollar of it (US B2C E-Commerce Report, 2012). B2C was the commercial transactions between businesses and consumers. In the UK, [www.agros.co.uk](http://www.agros.co.uk) and [www.ebay.co.uk](http://www.ebay.co.uk) were good examples of B2C since they offered their goods and services to customers online. They provided electronic products such as different types of

TVs; mobile phones; and digital cameras. The availability of physical space was one of e-commerce site's advantages. E-commerce extended the traditional commerce by offering products and services through electronic channels (Bidgoli, 2002, P50). B2C vendors have found success with online sales to consumers who may be interested in unique products. B2C e-commerce characterised from customer perspective that they can easily find the best price and trusted brands with good quality of customer services (Elliott, 2007).

**Figure2.4: A business-to-consumer (B2C) e-commerce configuration.**

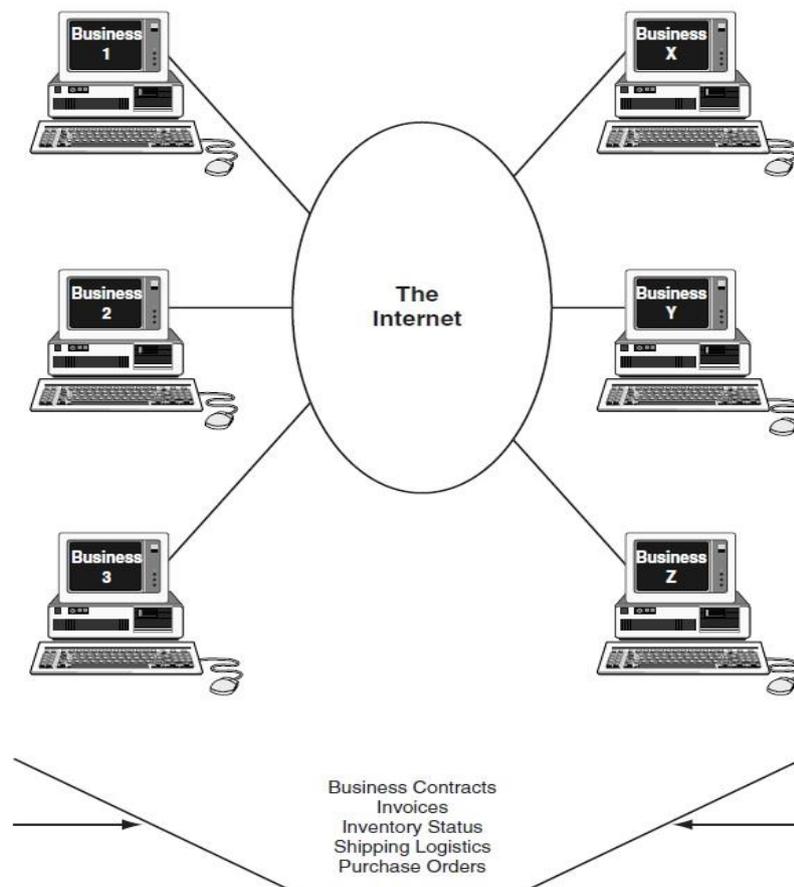


(Source: Electronic Commerce Principles and Practice, Bidgoli, 2002, P50)

### 2.3.2 Business to Business (B2B)

B2B is an electronic interaction between business firms, maybe two or more (Rahman and Raisinghani, 2000: p7). From the purchasing company's point of view, B2B EC is a medium for facilitating procurement management by reducing the purchase price and the cycle time (Kalakota and Robinson, 1999). B2B e-commerce does not just comprise the transaction through the Internet, but also the interchange of information before and the service after a transaction (Kaplan and Sawhney, 2000). B2B was growing faster and faster and e-commerce was of this type. Most experts predicted that B2B e-commerce would continue to grow faster than the B2C since this segment helped the business environment to be improved and enabled growth all over the world in a short time (Bidgoli, 2002, P52).

**Figure2.5: A business-to- business (B2B) e-commerce configuration.**



Source: Electronic Commerce Principles and Practice, Bidgoli, 2002, P53

Business-to-Business also helps the customers to make contact with a large number of potential clients without running into the problem of implementing a large number of communication channels (Luckling-Reiley and Spulber, 2001). E-commerce had an important role in global economic networks since its time cycle was short and information was exchanged quickly. B2B sales usually have a buying process that is commonly outlined in months and the sale is complicated rather than the one in B2C and sometimes it take additional months to complete. The lifetime value of a B2B customer is much higher than B2C due to the greater cost of sales and the possibility of repeat or add-on deals to the same customer (Barschel, 2007). B2B e-commerce is expected to grow explosively in the next few years and to continue to be the most important share of the electronic commerce market (Phillips and Meeker, 2000). B2B operations could be improved through interaction between activities; decisions; and knowledge across many functions. Hence, successful B2B became an increasingly important management issue (Laplaca, 2009). However, in some less developed countries, B2B electronic markets continued to be in their early stages of development and the lack of basic business infrastructures hindered the development of e-markets (Zhao et al, 2008). It is estimated that the B2B EC sector is going to be eight to ten times the size of the B2C EC sector (Mahadevan, 2000). In general, the worldwide B2B e-commerce has reached \$12.4 trillion in 2012, contrasted to \$3.4 trillion in 2005 (Safder, 2012).

## **2.4 E-commerce Challenges and Barriers**

The Internet coped only with only social activities entertainments but it dealt, also, with an enormous database. This was full of virtual and secret information which businesses and government held within their environments. It could be used, also, as a tool for foreign investment opportunities. Consequently, even governments or businesses, willing to enter the

e-commerce world, had to restructure their environment and invest in infrastructure which enabled them to compete in this race. Business needed, also, to re-strategize their plans to enter international markets and, through expanding export products and importing cheap raw materials for their production, to expand their operations to be able to benefit from the competitive advantages.

Some studies e-commerce challenges investigated how they could overcome these barriers. These challenges could influence the businesses structure even at microeconomic and macroeconomic levels. Businesses, which were keen to digitalize, needed to implement new management processes; follow different procedures for managing their workforce; and build new infrastructure which allowed them to implement the new strategy (Chaffey, 2004,p. 44; Laudon and Traver, 2004, p.197). As a result of the wide variety of software and hardware tools, a firm ought to choose the correct set of technologies for its IT infrastructure. It was important for the firm to choose the right type which suited its activities (Laudon and Laudon , 2002, p.58). Justifying the cost of e-commerce was considered to be one of the major challenges which the firm faced when trying to use e-commerce. The cost of developing e-commerce, within the firm, was relatively high and mistakes, due to lack of experience, could inflate these costs. Consequently, many firms decided to use e-commerce relying on intangibles such as the value of advertisement; improved customer services; and accumulated competitive advantage (Bingi, 2000). Particularly in developing and less developed countries, telecommunications infrastructure was, also, one of the challenges to the adoption of e-commerce since these nations were not yet ready to support the explosive growth of e-commerce. They needed to renovate completely their telecommunication networks and its equipment in order to take advantage of this new medium (Coppel, 2000). Kshetri (2007) studied the barriers to e-commerce and competitive business models in developing countries, He stated that there were many factors which inhibited the diffusion of e-commerce in

developing countries. These were such as slow internet diffusion; low bandwidth availability; unavailability of an online payment system; weakness of a physical delivery system; lack of legal protection for internet purchases; lack of business laws for e-commerce; and a lack of awareness and understanding of the potential opportunities of e-commerce. Another study, by Hunaiti et al. (2009) on e-commerce adoption barriers in Libyan SMEs, found that lack of experience with online trading; fear of conducting online transactions and the absence of business laws for e-commerce were the most important factors which inhibited Libyan SMEs' adoption of e-commerce

## **2.5 Summary**

E-commerce was characterized by its dependence on the knowledge and information based economy. It affected, also, the global economy in different ways. Firstly, it affected the information technology and economic sectors. By providing business with access to the internet, e-commerce enhanced, through information economy and foreign investment opportunities, the worldwide growth of productivity. Developed countries were benefiting already from the adoption of e-commerce and, now, were benchmarking their economies with their competitors especially in international markets. However, due to its high cost, developing countries continued to struggle to invest in information technology. Nevertheless, they benefitted from e-commerce by accessing international markets and had trade opportunities to stimulate their economic positions. Also, they could obtain foreign investment opportunities which might help them to setup and/or renew their information technology infrastructures. The technological and economical development gap between developed and developing countries was reflected, between them, in the level of adoption of e-commerce. Developed countries provided high level of services to businesses due to the critical role which they played in their economies. However, developing countries remained

at the development stages and tried to initiate campaigns for businesses and individuals environments to propagate the potential benefits and opportunities of using e-commerce at microeconomic and macroeconomics levels. Chapter three discusses the Internet and the adoption of e-commerce with a specific focus on SMEs.

# **Chapter Three**

## **SME Adoption of Innovation**

### **3.0 Introduction**

This chapter discusses the literature regarding the SMEs' adoption of innovation including e-commerce and identifies named factors which influenced the organisations' adoption of technological innovation. The chapter starts by defining SMEs, next, the decision making process in SMEs, and, then attempts to explain SMEs' adoption of e-commerce. Also, this chapter discusses the level of Innovation Implementation by researchers. Following that, having regard to previous studies, this chapter addresses the factors influencing the adoption of e-commerce. Namely, these are: individual factors; organisational characteristics; innovation characteristics; e-readiness; government support; and barriers to e-commerce. This chapter concludes by highlighting the gaps in literature in adopting e-commerce.

### **3.1 SMEs**

This thesis aimed to examine the Egyptian SMEs' adoption of the process of e-commerce. In order to be familiar with the importance of export and import firms, this section explores firstly the SMEs, generally, before concentrating on research conducted on the SMEs' adoption of information technology and their adoption of e-commerce in particular. The SMEs differed in size; had low productivity; suffered from lack of resources; and day-to-day management. Since the publication of the Bolton report in 1971, government; policy makers; academics; and researchers were interested in SMEs. This concentration on SMEs was due to their major role since SMEs were considered to be the originators of the economy and employment. It was expected that previously uncovered factors would have a particular contribution for modelling and in understanding the SMEs' adoption of the process of e-commerce.

SMEs indicate small and medium size businesses. The term Small and Medium sized Business or SMB became, also, more accepted in some countries. One of the main problems

which arose when trying to compare studies concerning the small firms, from a number of countries, was that there was no global agreement regarding its definition. Every country had its own definition of an SME and, in a country; every sector had its own definition. The number of employees and income determined whether or not a firm was a small or medium size enterprise.

Storey (1994) remarked that around 95% of all firms, in the European Union, were believed to be small and medium, offering more than half of all jobs. He remarked some firms were so small that they did not require official government registration. Therefore, within some countries, it was quite difficult to guess the population of small firms and to make significant comparisons with other countries. Bolton (1971) described small firms as firms likely to be controlled, in a highly personalised way, by the owner/manager and, commonly, the business was self-determining of other organisations.

The most commonly used measure was the level of employment, due to its easy availability and reliability in data collection. However, assets and turnover could be determined, also, but both were uncertain due to the firms' sensitivities about financial issues.

The European Union (Table 3.1) defined an SME based on the firm's number of employees and this definition was similar to the UK definition. It defined the micro-firms as employing less than 10 workers; the small enterprise had between 10 and 50 employees; and the medium-sized businesses had 51-250 employees (European Commission, 2009).

**Table 3.1: Illustration of EU definition of SMEs**

<b>Enterprise Category</b>	<b>Staff Headcount</b>	<b>Turnover</b>	<b>Balance Sh. Total</b>
Micro	< 10	€ 2 Million	€ 2 Million
Small	< 50	€ 10 Million	€ 10 Million
Medium	< 250	€ 50 Million	€ 43 Million

Source: U Europeaia, 2005

The US definition was quite different to the EU one since small sized businesses had less than 250 employees and medium sized enterprises had less than 500 employees (Table 3.2).

**Table 3.2: Illustration of USA definition of SMEs**

<b>Enterprise Category</b>	<b>Staff Headcount</b>
Micro	1-9
Small	< 50
Medium	< 250

Source: USAID, 2007

In the Asia-pacific area, the definition of SMEs varied from country to country. The most common measure, used within Asia Pacific Economic Cooperation (APEC), was the number of employees within the firm. Hence, APEC defined SMEs as businesses with less than 100 people; whereas, a micro firm employed less than 5 employees; a small firm employed between 5 and 19 and medium sized enterprise employed between 20 and 99 people (Table 3.3).

**Table 3.3: Illustration of APEC’s definition of SMEs**

Country	Definition of SME	Measurement
China	Varies with industry, usually less than 100 employees	Employment
Japan	<b>Wholesale</b> – less than 100 employees or JPY 100 million assets <b>Services</b> – less than 100 employees or JPY 50 million assets <b>Retail</b> – less than 50 employees or JPY 50 million assets <b>Other</b> – less than 300 employees or JPY 300 million assets	Employment and Assets
Malaysia	<b>Manufacturing</b> – less than MYR 25 million or 150 employees <b>Services</b> – less than MYR 5 million or 50 employees Different for Bumiputra enterprises Shareholders,	Funds and Employment
Republic of Korea	<b>Manufacturing</b> – less than 300 employees, or KRW 8 billion assets <b>Wholesale</b> – less than 100 employees or KRW 10 billion	annual sales revenue Employment, Assets and Sales Revenue

Source: Kotelnikov, 2007

Note: exchange rate: 100 JPY = 0.79 €, 1 MYR = 0.24 €, 100 KRW = 0.07 €

However, Egypt had a different definition for SMEs since the Central Agency for Public Mobilization and Statistics (CAPMAS) defined SMEs as enterprises which had less than 100 employees or an annual turnover less than LE 20 million (Table 3.4). Whereby, micro firms had 1-4 employees; small businesses had 5-49 employees and medium sized businesses had 50- 100 employees and fixed assets of no more than LE10 million.

**Table 3.4: Illustration of Egyptian Definition of SMEs**

Enterprise Category	Staff Headcount	Turnover	Balance Sh. Total
Micro	1-4	LE 100,000	LE 25,000
Small	5-49	LE 10 Million	LE 5 Million
Medium	50-99	LE 20 Million	LE 10 Million

Source: CAPMAS, 2004

Note: exchange rate: 1 LE = 0.11 €,

Therefore, every country had its own definition for SMEs; even, in the same country, this definition might differ due to many impacts like the nature of the industry or the volume of their annual sales.

### **3.2 The Decision Making Process in SMEs**

Previous studies acknowledged that, as he/she was the main decision maker, the CEO, of such a business, had an important role in whether or not the business was successful. Commonly, the majority of SMEs were managed by the owners who acted mostly as the CEO of the firm which had an invariable organisational structure (Raymond and Magnenat-Thalmann, 1982). Thong and Yap (1995) mentioned that the CEO's influence was much stronger in small businesses. This influenced this study's approach for a number of reasons; it was noted that, when compared with their equivalents in larger businesses (Hale et al, 1996), the SME owner/top manager had more effect on the company. The main issue about organisational structure was that the owner or CEO made the majority of the vital decisions in small businesses (Mintzberg, 1979). They performed, also, more than one function in managing the business's processes. These were: having a stronger contact with other key managers and having a full control of organisational resources. This included the decision connected with IT initiatives by determining whether to continue or to discontinue the completion of the adoption of IT adoption (Yap et al, 1992). Therefore, it seemed appropriate to believe that decisions made by small businesses were more likely decisions from the owners or CEOs themselves. The decision process of an SME's CEO/owner was more conjectural rather than being based on planned strategies and less formal when compared to large businesses (Rice and Hamilton, 1979).

Attewell (1992) mentioned that, for adopters of IT, the decision relating to the adoption of an innovation such as e-commerce required the reduction of the impediments to knowledge and

increasing the potential gained benefits. This was because an innovation's adoption and the diffusion were based on the knowledge and awareness of potential benefits to the adopters (Roger, 1995). Moreover, it was more likely that the decision to adopt IT would be delayed if the individuals or organisations had insufficient knowledge on how to implement and operate IT efficiently (Thong et al., 1996). Technology consultants and vendors could play a role in lowering this knowledge barrier and helping owners in making decisions on whether or not to adopt and implement IT (Nambisan and wang, 2000). Making business decisions was considered to be a relationship between learning; information; and knowledge. Hence, it started with the conceptualisation of the information (learning) and, next, the learning process led to knowledge which could be utilised to support and inform the decision making process. The final stage was the feedback which could generate further information and, consequently, would lead to further learning (Rowley, 2000). Information Utilization (IU) was significantly important to firms' final decisions, because information was supposed to be worthless unless it was directed to good use (Wilton and Myers, 1986; Deshpandé and Zaltman, 1982; Ottum and Moore, 1997). On the other hand, as a result of not having positive attitudes and being unwilling to take risk concerning technological change (Kalakota and Robinson, 2001), an SME's owner/top managers could be a barrier to the company's adoption and diffusion of new technologies .

### **3.3 SMEs' Adoption of E-commerce**

There has been greater growth than before in utilising the Internet due to the huge added-value to the firm especially when adopting e-commerce (Ratnasingam, 2000). The Internet, and especially e-commerce, was a significant technological innovation for a huge portion of SMEs [Riemenschneider and McKinney, 1999]. SMEs utilised e-commerce essentially for information and communication functions (Kula and Tatoglu, 2003; Lai et al., 2002;

Mehrtens et al., 2001). However, the global growth of e-commerce, in particular B2B e-commerce, and e-government were driving SMEs to venture into the Internet (Drew, 2003) in order to be vital suppliers to large businesses and governments. Hamilton (2003) stated that, in the UK, more than 99% of businesses, with over 50 employees, had access to the Internet but, due to the high costs, many SMEs could not upgrade their ICT infrastructure to move from being an adopter of simple e-commerce adopter to e-businesses. Although SMEs were launching e-commerce, there were indications that they were not utilising e-commerce to its full potential (O'Connor and O'Keefe, 1997; Peet et al., 2002). Moreover, SMEs, which had developed e-commerce competences, had not done so strategically and, as yet, had to benefit from savings in both time and significant costs (Quayle, 2002). In the UK, the digital gap, between large firms and small businesses was increasing and small businesses' online trading was very slow and this gap widened because of shortages in investment and poor strategies to exploit e-business (Zheng, et al., 2004). Additionally, the SMEs owners/top managers' orientations and motivations were found to influence their adoption of e-businesses (Fillis and Wagner, 2005). Generally, as a result of inadequate resources and limited education about IT (Cragg and King, 1993, Ein-Dor and Segev, 1978) small businesses faced significantly greater risks in IT application than large businesses.

There was some proof from surveys, conducted across the world, that e-commerce, between SMEs, was accepted as being slow (Taylor et al., 2004). Consequently, due to the low level of information and communication technology (ICT) diffusion, particularly in a developing economy, there was a lack of e-commerce awareness (Molla and Licker, 2005). For SMEs, the opportunities, for SMEs, provided by the adoption of e-commerce, remained unclear even though there were some researches which investigated the relationships between SMEs and the adoption of e-commerce (Tagliavini et al., 2001).

Many factors, influencing the successes of adoption of new technologies, were generic in nature (Windrum and De Berranger, 2003). Studies, conducted on the SMEs' adoption of e-commerce, were likely to focus on the types of adoption and factors which influenced their adoption (Poon and Swatman, 1997). Findings from these studies, connected with observed findings in the area of the SMEs adoption of IT, focused on promoting the potential benefits and difficulties to the adoption of e-commerce (Fink, 1999). Also, they focused on the identification of success factors and the reasons which hindered the implementation of information system (IS) (C Liu, KP Arnett, 2000).

Our knowledge, of e-commerce adoption issues, in SMEs, and even less in respect of B2B e-commerce (Wirtz and Wong, 2001; Gebaucer and Shaw, 2002; Teo and Ranganathan, 2004) was still inadequate and needed more investigations (Kendall et al., 2001; Jeffcoate et al., 2002), Therefore, many SMEs failed to develop e-commerce since there was little information which had been adapted to their circumstances (Jeffcoate et al., 2002). Additionally, although the widespread there was recognition of the large businesses' adoption of e-commerce by, amongst SMEs, the extent of e-commerce practice varied widely (Sadowski et al., 2002; Kula and Tatoglu, 2003). Whereas some SMEs benefited from speedy Internet growth, Molla and Licker (2005) mentioned that the understanding of what drove e-commerce amongst businesses, particularly in developing countries, remained uncertain. This might be down to the fact that previous e-commerce research concentrated on businesses in developed countries such as the USA and the UK (Daniel and Wilson, 2002; Ellis-Chadwick et al., 2003; Doherty et al., 2003, Doherty and Ellis-Chadwick, 2003; Simpson and Docherty, 2004; Pavic et al., 2007; Y Wang, PK Ahmed, 2009).

### **3.4 The Diffusion Of Innovation (DOI)**

There was an increase of literature which sought to describe the adoption of innovation adoption and its diffusion (Kwon and Zmud, 1987; Davis, 1989; Prescott and Conger, 1995; Rogers, 1995; Fichman, 2000). There was complexity in approving a method to measure innovation (Ravichandran, 1999). Consequently, as yet, there was no consensus on a single definition for innovation (Wan et al., 2005). Rogers (2003, p.12) defined an innovation as “an idea, practice or object that perceived as new by the individual or other unit of adoption”. This description was used to refer to an individual or any other unit of adoption since it was commonplace, in literature, to refer to consumers as potential adopters (Rogers, 2003, p.12). However, Dutton (1986) defined it as being any system, product or service recognised as new by the adopters in an organization. From an organizational perspective, innovation was something which was new or considerably improved; and completed by an organisation to create significant value either directly for the enterprise or indirectly for its customers (Business Council of Australia, 1993, p3). Additionally, an innovation was the use of new technological and business information to offer new services or products required by customers (Afuah, 2003).

### **3.5 Firm Level of Innovation Adoption**

In the literature, there was an increasing interest to concentrate on contexts describing the firm's practice in adopting innovation. Zaltman et al. (1973) concentrated on the innovation adoption procedure as it occurred in multi-member units such as in an organisation. Rogers (1995) and Damanpour and Gopalakrishnan (1998) emphasised the importance of studying the organisational level of innovation adoption. Rogers (1995) explained that, in an organisation, the innovation adoption process took place in three stages. The reorganisation

stage happened when an innovation slowly but surely began to lose its foreign character to the firms' needs. The next stage was illustrative; this allowed firms to put innovations to widespread use when these became clearer to their members. The final stage was making routines, when organisations integrated the innovation and the innovation lost its isolated identity. Many researchers considered Rogers's framework to be distinguished and they adopted it in their studies in the diffusion of innovation (Agarwal et al., 1997; Gallivan, 2001; Rajagopal, 2002).

Over the years, a number of structures were expanded to assess the innovation diffusion process (Presscot and Conger, 1995). However, the developed frameworks, such as examining technology (Zmud and Apple, 1992), grading EDI (Chau, 2001; Chwelos et al., 2001; Kuan and Chau, 2001) and programming language (Fichman, 1997) were used mostly to explain the process of adopting innovation. Inadequate consideration was given to Internet technologies and, in particular, e-commerce.

### **3.6 E-commerce as an Innovation**

E-commerce, as a developed technology with meaningful managerial inferences, could be one of the most important innovations in the last decade. Like innovations in process, the adoption and diffusion of e-commerce was a concluded procedure in which an individual or other decision-making unit circulated first knowledge of an innovation in order to create an attitude concerning the innovation. Then, this would lead to a judgment to adopt or decline the innovation; if adopted, to employment of the new idea; and to confirmation of this decision'(Rogers, 1995). Therefore, willing, innovation-oriented businesses would form strategies which were more likely to stimulate activities with attitudes which were open to innovation (Han et al., 1998; Hurley and Hult, 1998; Srinivasan and Rangaswami, 2002;

Frambach and Schillewaert, 2002). These strategies could be construed as encouraging initiatives in the adoption of e-commerce, and being more accepting towards failures on the way of discovery (Zhuang, A.L. Lederer, 2006). Therefore, it was important to consider e-commerce innovation as an innovation which resulted from new organisational implementation of e-commerce technologies (Zwass, 2000; Wu and Hisa, 2004). Additionally, the success of e-commerce implementation, as an innovation, would rely on information technology; business model; and external factors (Santos and Peffers, 1998). Also, e-commerce innovation was based on five dominant actions which were computation; connection; communication; commerce; and collaboration (Zwass, 2003). Based on Swanson's (1994) definition of IS innovation, e-commerce innovation could be described as an innovative organisational application of e-commerce technologies which could be based on IT applications; business model (processes); and the partnerships with customers and suppliers.

### **3.7 Level of Innovation Implementation**

Any new innovation was quite mysterious for any firm especially when it was in early stages of development. However, the adoption of such innovation occurred at different levels (Hall et al., 1975) and this adoption did not occur in a single level process but it involved multiple levels (Brand and Huizingh, 2008). The introduction of new technologies, like the Internet, was followed frequently by a complementary innovation such as e-commerce (Kamal, 2006). Huizingh and Brand (2009, p.268) mentioned that the adoption of integrated innovations like the Internet and e-commerce counted as multi-level phenomena and their adoption included more levels than simply adopting or rejecting the application. Few researchers considered this model of levels of adoption from an e-commerce perspective (Daniel and Wilson, 2002; Houghton and Winklhofer, 2002; Doherty et al., 2003; Kula and Tatoglu, 2003; Dholakia and

Kshetri, 2004; Ritchie and Brindley, 2005; Aguila-Obra and Padilla-Melendez, 2006; Darabi et al., 2007; Jones et al., 2007; Huizingh and Brand, 2009) and these studies focused on a developed country approach. Moreover, these studies did not make an attempt to study the factors which influenced these different levels but focused on informing the existence of different levels (Hamill and Gregory, 1997). Also, they did not make an effort to test these factors quantifiably (Houghton and Winklhofer, 2002).

In a study on SMEs adoption of the Internet, Dholakia and Kshetri (2004) mentioned that the adoption of the Internet happened in levels and every phase was determined by its own factors. They found that the size of the firm had a significant influence on website ownership. However, there was no effect on selling on the Internet.

Based on an empirical study on the adoption of e-commerce by UK SMEs, Daniel et al. (2002) found that there were four groups of adopters ,namely, developers; communicators; web presence; and Transactors (Table 3.5). These outcomes showed that such SMEs ought to go through these four gradual levels to reach their adoption of e-commerce. In addition to the main activities in the previous level, each level had its own activities. However, this study did not address which factors affected the adoption and which factor influenced which level.

**Table 3.5: Innovation Adoption levels by Daniel et al., (2002)**

<b>Author</b>	<b>Innovation Type</b>	<b>Adoption stage</b>	<b>Explanation</b>
Daniel et al., (2002)	Internet	1- Developers	This includes offering information about the firm's products/services and utilising email communication with supplier and customers.
		2- Communicators	Same actions in Developer level with more massive use of Internet communication with customer and supplier and documents swapped between the members of the firm.
		3-Web presence	Same activities in the previous levels with more availability of receiving online orders.
		4-Transactors	Same actions in the previous 3 levels and customer services especially after sale and accepting online recruitment.

Source: Adopted from Daniel et al., (2002)

In their empirical study of B-to-B e-commerce adoption by manufacturing SMEs, Lefebvre et al., (2005) found that the adoption of e-commerce could occur through one of six levels (Table 3.6). Two of them were non-adopters with willing or unwilling to adopt and four with different characteristic of adoption which take place from simple adoption to more complex e-commerce activities such as e-collaboration with customers and suppliers. However, without investigating which factors could affect each phase, this study aimed to discover the adoption of e-commerce trajectories.

**Table 3.6: Innovation Adoption levels by Lefebvre et al., (2005)**

<b>Author</b>	<b>Innovation Type</b>	<b>Adoption stage</b>	<b>Explanation</b>
Lefebvre et al., (2005)	E-commerce	00-Non-adopter with no interest in e-commerce	This belongs to non-adopters SMEs with no plan to be involved in any e-commerce activities.
		0- Non-adopter with interest in e-commerce	This refers to firms not presently adopting any e-commerce activity but intending to do so in the near future.
		1-E-commerce information content & search formation	This relates to SMEs which are only utilising activities connected to electronic information searching and content creation
		2-E-transaction	This includes uncomplicated e-transactions such as buying products/services exploiting electronic catalogues.
		3-Complex E-transaction	This includes more complicated e-transactions such as negotiating contracts on-line or participating in electronic auctions.
		4-E-collaboration	This includes wider range of e-commerce activities that encourage e-collaboration with customers and suppliers

Source: Adopted from Lefebvre et al., (2005)

Another study investigated the adoption of e-commerce between UK electronic manufacturers. Parish et al. (2002) mentioned that there were 5 levels (Table 3.7) relating to the adoption of e-commerce. These were, namely, e-mail for messaging and communications; online marketing for promotions; online ordering using the Internet; online payment for paying product/services; and order progress/online sales service for progressing orders and any further communications after sales. The low level of adoption seemed to be related to the size of the micro-businesses since many SMEs had limited access to resources.

This study investigated the adoption phases and what was contained at each level. However, the study did not investigate the factors' effects on each level.

**Table 3.7: Innovation Adoption levels by Parish et al. (2002)**

<b>Author</b>	<b>Innovation Type</b>	<b>Adoption stage</b>	<b>Explanation</b>
Parish et al. (2002)	E-commerce	1-Messaging	This includes using email communication with customers and suppliers
		2-Online marketing	This includes using the website to advertise and promote products/ services.
		3-Online ordering	This includes availability of offering online orders for customers.
		4- Online payment	This includes paying product/services prices' through the Internet by using one or more online payment tools.
		5-Order progress/ online sales support	This includes availability of tracking orders progresses and any customers/businesses' inquires after selling products/services.

Source: Adopted from Parish et al. (2002)

In their study of South African businesses' adoption of e-commerce, Molla and Lickert (2005), proposed a model to investigate the organisational and external factors which influenced the adoption of e-commerce. They found that there were five levels of e-commerce adoption (Table 3.8); these which were: unconnected to the Internet; connected to the Internet; static e-commerce, interactive e-commerce; trans-active e-commerce; and

integrated e-commerce. However this study focused only on two types of factors and did not investigate the factor's effect on different levels of the adoption of e-commerce.

**Table 3.8: Innovation Adoption Levels by Molla and Lickert (2005).**

Author	Innovation Type	Adoption stage	Explanation
Molla and Licker, (2005)	E-commerce	1-Not connected to the Internet	No e-mail and no broadband connection.
		2-Connected to the Internet	This includes using e-mail but there is no website.
		3-Static e-commerce	This includes one side communication such as distributing the firm's basic information on the Internet but there is no interactivity.
		4-Interactive e-commerce	This includes receiving e-mails from users, accepting queries and registration forms.
		5-Trans-active e-commerce	This includes online selling and purchasing of products/services.
		6-Integrated e-commerce	This includes having a website to enable most business activities to be conducted electronically.

Source: Adopted from Molla and Lickert (2005).

It was clear from previous results and discussions that typifying the adoption of e-commerce, grounded on connectivity, resulted in subjective categorisation of adoption levels. Factors relating to the adoption of innovation and the adoption of e-commerce could vary according to the stage or level of adoption which had to be considered. This underlined the importance of taking in account the level approach when studying the adoption of e-commerce.

### **3.8 Factors Influencing the Adoption of E-commerce**

Generally, the adoption of innovation was expected to play a part in the performance or usefulness of the adopting business. This adoption resulted in individual; organisational; and environmental factors which influenced the rate of this adoption (Damanpour, 1991). The following section discusses previous studies which attempted to classify the factors related to the organisational adoption of innovation and which might be appropriate to the adoption of e-commerce.

Ein-Dor and Segev (1978) studied the organisational factors which affected the success of IS systems. They classified the factors into three groups as unmanageable; partially manageable; and manageable. Rogers (1995) studied the influences of innovation attributes on the adoption and diffusion of innovation. However, in order to identify new factors, some other studies such as Frambach et al, 1998; Thong, 1999; Frambach and Schillewaert, 2002; Lertwongsatien & Wongpinunwatan, 2003; Al-Qirim, 2007; and Scupola, 2009 investigated other approaches by providing more comprehensive frameworks to study the adoption of innovation.

It was believed that an innovation, like the Internet, was highly technological and complex in nature because it depended on transferring computer technology processes into text; pictures; or videos. Also, it was complex because it was a mixture of different technologies and several innovations (Houghton and Winklhofer, 2003).

The adoption of innovation by organisation could be identified from two types of organizational adoption decisions. These were the decision made by an individual, within an

organization, and the decision made by an organisation. Each type had its own factors which could influence the direction of that decision (Frambac and Schillewaert, 2002).

The next table lists the factors identified in previous studies and which were used mostly to investigate the adoption of technological innovation. These factors could be classified in six main groups which were: individual factors; organisational characteristics; e-commerce characteristics; technology readiness; government support; and e-commerce barriers. Those studied the adoption of innovations and the SMEs' adoption of e-commerce by (Pohlen, 1996; Busselle et al., 1999; Glushko et al., 1999; Sultan & Chan, 2000; Brancheau & Wetherbe, 1990; Lockett & Littler, 1997; Thong, 1999; Corbitt, 2000; Filiatrault and Huy, 2006; Olatokun and Kebonye, 2010).

**Table 3.9: Factors Affecting the Adoption of Innovation**

<b>Group</b>	<b>Factors</b>
<b>Individual characteristics</b>	Decision maker's age
	Decision maker's gender
	Decision maker's education level
	Decision maker's position
	Top management support
	Top management attitude
<b>Organisational characteristics</b>	Organisation activity type
	Organisation size
	Organisation age
	Organisation capital/ assets
	IT knowledge
	Marketing capability
<b>Innovation characteristics</b>	Geographical distance
	Communication tools
	Researches environment
	E-commerce future strategies
	Business relationship
	Company tasks
<b>E-readiness</b>	E-readiness
<b>Government support</b>	Government support
<b>E-commerce barriers</b>	E-commerce barriers

### **3.8.1 Individual characteristics**

Individual attributes were considered to be important factors which could affect the direction of the adoption of e-commerce as a part of organisational factors which might contribute to the successes from adopting an innovation. This importance arose from the reason that the adoption decision was made by those who were part of the organisation and their characteristics influenced the adoption decision. There were few studies, related to the adoption of innovation, which attempted to focus on the characteristics of the individual who was the basic pivot of the adoption decision. A study showed that profiling such businesses

and their owner/managers could help to understand their characteristics and motivations which had a direct impact on shaping the business (Fillis, 2000).

**Table 3.10: Individual Characteristics**

Factor	Source	Description	Comments
<b>Age</b>	Zmud, 1979; Assael, 1981; Sindi, 1992; Brancheau and Wetherbe, 1990; Rogers, 1995; Li et al., 1999; Busselle et al., 1999; Stafford et al., 2004; Lu et al., 2006.	This could be used to refer to the decision maker's age.	Many studies referred to the important role of the ages of the individuals who were responsible for the adoption decision. However Rogers (1995) found that there was no consistent relationship between individual age and the adoption of innovation.
<b>Gender</b>	Zmud, 1979; Harrison et al., 1992; Gefen and Straub, 1997; Busselle et al., 1999; Lin, 1998; Kwon, 2000; Mikkelsen et al., 2002; Rodgers and Harris, 2003.	This state related to the decision- maker being male or female.	Mixed results were presented for the relationship between gender and the adoption of innovation. Some studies found that women had a greater tendency towards the adoption. However, other studies showed that men a had greater tendency concerning the adoption
<b>Education level</b>	Mayer et al. 1995; Chen and Dhillon, 2003; Friedberg 2001; Lu et al., 2006; Riddell and Song; 2012	This indicated the number of years of formal education which the individual had had.	Some studies found that the higher education, which individual had had, resulted in a greater interest in an innovation (Riddell and Song, 2012). Other researches indicated that there was no significant relationship between individual's education levels and the adoption of an innovation (Lockett & Littler, 1997)
<b>Position</b>	Crook and Kumar, 1998; Mehrtens et al., 2001; Premkumar and Ramamurthy, 2007;	This referred to a description of an employee's role and described his/her responsibilities in the organisation.	Some studies showed that the more responsibility, in the firm, the greater control on the decision about the adoption of innovation.
<b>Top management support</b>	Montealegre, 1998; Premkumar and Roberts, 1999;	This referred to the important of the support from owner/manager who	Researches emphasised the importance of the owner/management support

	Sultan & Chan, 2000; Beatty et al., 2001; Ramsey <i>et al.</i> , 2003; Doherty et al., 2003; Lacovou <i>et al.</i> , 2005; Molla and Icker, 2005; McCole and Ramsey, 2005; Wang et al., 2010.	prepared the environment and provided the required resources to enable the firm to be able to utilise such new innovation	towards change and accepted or rejected the innovation adoption and there was a significant relationship between top management support and the adoption of innovation
<b>Top management attitude</b>	Thong, 1999; Premkumar and Roberts, 1999; Corbitt, 2000; Fillis et al., (2004); Schillewaert et al., 2005; Abukhzam and Lee, 2010.	This referred to the decision maker's approach and whether or not he/she was flexible to accepting new changes to the firm, convinced about the new innovation.	If the top management was dynamic and more involved in understanding IT, they would be more likely to be positive towards new innovations (Abukhzam and Lee, 2010)

These researches provided wide understandings of the importance of individuals characteristics especially when the adoption decision was made by an individual who was a member of an organisation. This importance became more significant when studying the SMEs' adoption which was characterised by the owner/manager being more influential than those in large firms. Some researches focused on studying individual factors such as only age and gender (Zmud, 1979), whilst others focused on individual factors such as education level; Top management support; and Top management attitude (Thong, 1999). These studies did not attempt to study individual factors in a systematic way unlike as in this study in which the researcher tried to compact individual factors to six sub-factors in order to validate the importance of individual characteristic in the adoption of innovation.

### 3.8.2 Organisational Characteristics

The second groupings of factors, which affected the adoption of innovation, referred to organisations' characteristics. The outcomes and findings, from a variety of previous

researches, referred to either the positive or negative influence of organisational characteristics on the firm's adoption of innovation.

Many researchers, who studied the adoption of innovation, concentrated on underlining the factors related to the business. These factors fluctuated between the positive and negative impacts on the situations relating to the adoption of innovations (Grant, 1991; Day, 2005; Freeman et al., 2003; Simmons et al., 2007; Olatokun and Kebonye, 2010).

**Table 3.11: Organisational Characteristics**

<b>Factor</b>	<b>Source</b>	<b>Description</b>	<b>Comments</b>
<b>Firm Type</b>	Pohlen,1996; Filiatrault & Huy, 2006; Fillis et al., 2003; Teo et al., 2009; Olatokun and Kebonye, 2010	This could be referring to the type of industry type and the firm's location . These types varied from services to manufacturing or any other type. Every industry had its own information process. Organisations, with more concentrated information processes, were more likely to adopt innovation than those with lower concentrated information processes (Goldmanis et al., 2009).	Some studies referred to the existing relationship between the type of industry and the adoption of e-commerce (Yap et al. 1999) whilst others indicated that the type of industry type did not indicate any relationship with the adoption of e-commerce (Teo et al., 2009).
<b>Firm size</b>	McDonagh and Prothero, 2000; of Freeman et al., 2003; Fillis and Wanger, 2005; Iyer et al., 2009; Olatokun and Kebonye, 2010	This state referred to the size of an organisation and whether was a large or SME firm. This was measured mostly by the number of employee in the organisation. The EU defined SMEs based on the numbers of people employed in the business (Fillis and Wanger, 2005)	There were mixed results concerning the relationship between gender and the adoption of innovation. Some studies found that women had a greater tendency for the adoption of innovation; however, other studies showed that men had a greater tendency concerning the adoption of innovation.
<b>Firm capital/ Assets</b>	Lacovou et al., 1995; Premkumar and Potter, 1995; Fillis et al., 2003; Alamro and Tarawneh, 2011;	This indicated the size of the organisation since it could be measured by the firm's fixed assets (Thong, 1999). Also, it referred to the financial resources as an indication of the organisation's	Some studies showed that the greater the access to financial resources, the greater the chance of adopting an innovation (Lacovou et al., 1995). Also, small firms, with better financial resources, had a greater

		ability to provide resources which might be needed for the adoption of innovation.	ability to adopt e-commerce (Premkumar and Potter, 1995).
<b>Firm age</b>	Thong, 1999; Bertschek and Fryges, 2002; Ordanini and Rubera, 2010; Brynjolfsson, 2011	This indicated the number of years which the organisation had been in business. This factor was used commonly to investigate its relationship with the adoption of innovation.	Some studies showed a negative relationship between the firm's age and the adoption of e-commerce (Grimes et al. 2012), whilst other studies showed that the firm's age had no impact on the adoption of e-commerce (Meyer, 2011).
<b>IT knowledge</b>	Thong, 1999; Mirchandani and Motwani, 2001;	This factor was used to refer to either the organisation's employees or managers' knowledge of information technology. for	Previous researches showed a significant positive relationship between either firm managers or employees IT knowledge and the adoption of innovation.
<b>Marketing Capability</b>	Day, 1994; Simmons et al., 2007; Leskovar-Spacapan and Bastic, 2007; Benedetto et al., 2008	This indicated the organisation's or individuals' capability to use marketing to produce better added value for customers or businesses and to generate valuable demand which ought to lead to better growth.	Some studied showed a significant positive relationship between the organisations's marketing abilities and the adoption of innovation (Leskovar-Spacapan and Bastic, 2007).

Some studies showed either a positive or negative significant relationship between the organisation's characteristics and the adoption of innovation whilst other studies showed no significant relationship between some organisational factors and the adoption of innovation. Generally, these researches showed the importance of organisational characteristics and these influenced the organisation's decision concerning the adoption of innovation. However, most of these studies focused on one or two factors as a group and did not investigate the rest of the potential organisation factors. For example, Thong and Yap (1995) studied the factors which influenced the firms' adoption of IT and they measured the firm size only as an

organisational factor of the adoption process. Thong and Yap (1996) repeated the study on the adoption with some improvement in the measured factors and they used firm size and employees' IT knowledge as organizational factors. However, they did not use the firm's marketing capabilities or type of industry or the firm's age to examine the impact of such factors on the direction of adopting IT. This study tried to group, in a systemic way, organisational factors in order to investigate every possible organisational factor which might influence the SMEs' adoption of e-commerce by.

### **3.8.3 Innovation Characteristics**

Previous studies, on the diffusion of innovation, identified over 21 characteristics of innovation (Zaltman et al., 1973). The majority, of these researches, examined mainly the adoption of innovation in the context of individual decision makers such as managers (Rogers 1995; Sultan, Farley, and Lehmann 1990). On studying the relationship between innovation characteristics and innovation adoption there were three characteristics (relative advantage; compatibility; and complexity) which identified mainly the most reliable relationships to the adoption of innovation (Tornatzky and Klein, 1982). There were two dimensions which could stage Innovation Characteristics. These were: a micro paradigm which considered the perceived characteristics of the organisation's members which either impeded or facilitated the use of innovation; and a macro paradigm which considered the organisations' characteristics which either impeded or facilitated their adoption of innovation.

**Table 3.12: Innovation Characteristics**

<b>Factor</b>	<b>Source</b>	<b>Description</b>	<b>Comments</b>
<b>Geographical distance</b>	Fillis, 1999; Senn, 2000; Mueller, 2000; Wong, 2003;	This referred to the distance between two markets in traditional trade; it was considered to be an important factor on market choice and there was a relationship between geographic distance and international interactions (Chang et al., 2004). However, in e-commerce geographic distance disappeared as a business barrier (Senn, 2000).	When deciding on internationalisation, some studies indicated that organisations preferred to deal with markets closer to them. However, other studies stated that, when carrying out e-commerce, geographic distance had no impact of on market choice (Wong, 2003).
<b>Communication tools</b>	Glushko et al.,1999; Osmonbekov, 2002;	This state referred to the elements which could be utilised to enable organisations to communicate over the Internet using EDI or messages which individuals and businesses could understand. Also, it told trade partners about the products/services which an organisation could offer and which documents to use when using those services (Glushko, 1999).	It was mentioned that the quality and quantity of communication tools related to the adoption of innovation. Also, it was characterised by utilising many communication elements anytime and anywhere.
<b>Research environment</b>	Mansfield, 1998	This referred to a systematic approach and techniques which assisted researchers and practitioners to understand the processes in adopting innovation (Lodico et al., 2010). There was little existing theoretical and empirical research on the topic of e-commerce. The research's main benefit was that it focused on measurable outcomes in investing in e-commerce (Steinfeld, 2002).	Studies referred to the importance of an adequate academic research on the adoption of such innovation since it promoted our awareness of the value and necessity of knowledge of the new innovations. Innovation was one of the most important subjects in recent business research (Hauser et al., 2006).

<b>E-commerce future strategies</b>	Daniel, 2002; Grando and Pearso, 2004	This indicated an organisation's development plans and whether or not these plans stimulated the firm's situation and how these strategies brought about a flexible and effective approach (Meyer-Krahmer and Reger, 1999).	Studies showed that managers, who perceived e-commerce as adding strategic value to the firm, had, also, a positive attitude towards the adoption of e-commerce (Grando and Pearso, 2004).
<b>Business relationship</b>	Lacovou et al., 1995; Kraemer et al., 2000	This factor was used to refer to the received support from other businesses partners who might stimulate or inhibit the adoption of innovation.	Previous researches showed that support, from partners, enhanced greatly the firm's integration of technology (Lacovou et al., 1995).
<b>Company tasks</b>	Baourakis et al., 2002; Chaston; 2002; Gallagher and College, 2002; Chan et al., 2003;	This indicated the processes which product/services went through until reaching their final shapes. It referred, also, to the nature of each stage and the flexibility of the development process as a result of adopting innovation.	Some studied stated that the impact of e-commerce on the firm's marketing was very important and vital for future business (Baourakis et al., 2002).

These studies highlighted the importance of the innovation characteristics and its impact of the adoption of such innovation. They found that the decision, on the adoption, was affected by the perceived relative advantage which the firm would gain when it involved, in the adoption process, such as the effect of zero geographical distance; gaining more business partners; the flexibility of conducting researches on innovation; stimulating future strategies plans; and improving the organisation's tasks. However, an assessment, of business marketing research, showed that it was possibly risky to distribute a description based on a scenario. It was more valuable to recognise the impact of the social environment in determining a more involved owner/manager point of view which took into account a wider range of owner/manager philosophical matters (Fillis, 2000). Some factors showed either a positive or negative significant relationship with the innovation adoption, whilst others did

not show any significant relationship with the adoption of innovation. These studies attempted to investigate such factors in a random way and did not examine them in a systematic way. This research aimed to focus on the micro paradigm which considered the owners/managers' perceived characteristics (relative advantage) by which might have an impact on the direction of the adoption process.

### **3.8.4 E-Readiness**

Previous studies showed that there was general agreement on the suitability of various e-readiness indicators (Huang and Zhoa, 2004). The e-readiness was used to identify gaps, between individuals and organisations, in the use of digital technology. The literature helped to understand the concept and overview of e-readiness and the relationships with the development of change in the direction of digital growth (Khoja et al., 2007, Rosenzweig and Roth 2007). The environmental and organizational indicators remained scarce to provide specific factors which influenced the adoption of B2B e-commerce (Molla and Peszyenski, 2011; Kurnia, 2008; Dada, 2006; Rizk, 2004). Based on the literature, there were two different types of e-readiness: Individual readiness which referred to the owner/top management's personality; motivation; and characteristics of concerning the adoption of innovation; and enterprise readiness which referred to an organisation's ability to afford technology, innovation procedures and strategies. This included technology variables such as technology infrastructure; the existing system's capability and government readiness (Zakaria and Janom, 2011). Previous empirical studies, related to e-readiness in developing countries, indicated either significant positive or negative relationships with the adoption of innovation (Molla and Licker, 2005). These studies conducted their investigation in a random way and many of them attempted to use e-readiness factors alone without combining them, in a systematic way, with other types of factors such as organizational characteristics and

individual characteristics. This research tried to provide a comprehensive picture in assessing the adoption of innovation from a multidimensional viewpoint.

### **3.8.5 Government Support**

The Australian Industrial Research and Development Incentives Board (1985, P5) referred to government support as a series of actions undertaken by the government to provide a suitable environment for individuals or organizations to stimulate the adoption of innovation. This support could be either grants or subsidies or advice on international trade for organizations or building a required infrastructure which ought to serve both individuals and organizations (Castleman and Swatman, 2000). Government units were considered to be one of the most effective institutional forces influencing the adoption of innovation (Nelson and Soete 1988). A study stated that government procedures, which stimulated the firm's ability to compete in the trading market, had a strong positive effect on the development of a technology strategy at the commercial level (Mowery and Rosenberg, 1979). The government used the Internet for tax; procurement, and other services which encouraged e-commerce activity in the private sector (Tigre 2003). Wong (2003) stated that active government policies had a significant influence on the adoption of ICT in Singapore. However, the lack of government support could be a huge inhibitor on the adoption of new technology innovation (Goh, 1996). The review, of previous studies, showed that environment characteristics, such as government support, were significant motivators in the adoption of e-commerce (Looi, 2005). Chan and Al-Hawamdeh (2002) stated that the government initiatives had a strong impact on businesses' adoption of e-commerce. However, in investigating the case for adoption, most of these researches used this factor in random way. This research tried to use this factor, in a logical way, along with other factors to investigate its effect on the adoption of e-commerce

and to show whether or not this factor would be a driver or a barrier to the adoption of e-commerce.

### **3.8.6 Barriers to E-commerce**

This referred to the factors which might be considered to be inhibitors on an organisation's path as to whether or not it adopted an innovation. These barriers could prevent competitors from adopting innovation easily. Lawrence and Tar (2010) conducted a study, on the barriers to e-commerce, which focused on the factors which described governmental policies environments; socioeconomics; the technological infrastructure; and socio-cultural issues which obstructed the adoption and diffusion of ecommerce in developing countries.

Hadjimanolis' (1999) study, on Cyprus SMEs' adoption of e-commerce, indicated that obstacles to the adoption of e-commerce could be classified as having the status of the organisation's internal or external barriers. Moreover, Lawrence (1997) categorised the e-commerce barriers into 3 categories. These were: individual; organisation; and industry barriers which included the lack of financial resources; the lack of use technology; and organisation restriction to change. Additionally, on a study of SMEs owners, Puro and Cambell (1998) found that the most significant factors, which prevented SMEs owners from adopting e-commerce, were the failure to see any benefit of utilising e-commerce; unaffordable set up costs; the lack of technical know-how; and security concerns. In the same vein, Farhoomand et al (2000) conducted a cross-cultural study of Finland and Hong Kong SMEs. They found that failure to understand how e-commerce could be used was the most common factor which hindered the practice of e-commerce. Another study, by Keeling et al., (2000), on the facilitators and barriers to the use of e-commerce, found that the most common barriers, which impeded SMEs' adoption of e-commerce, were the absence of clear

government policies and the lack of banking system facilities. It was assured that e-commerce could be an extremely beneficial element for organisations and countries if specific problems could be solved and the government had clear strategies towards the adoption and diffusion of e-commerce. Also, the government needed to provide the suitable settled environment and the required tools to utilise e-commerce. This research used these factors to provide, from every possible organisational and individual angle, a full view of the adoption of e-commerce.

### 3.9 Perceived Benefits of Adopting E-commerce

This part refers to the expected advantages which an organisation could gain as a result of adopting e-commerce. There were claims that e-commerce could convey significant benefits to organisations in developing countries (Molla and Heeks, 2007). Perceived benefits referred, also, to the level of acknowledgment of the relative advantage which technology could provide the organization. Many studies attempted to identify the perceived benefits which EDI technology had to offer. These were classified into two groups: direct; and indirect benefits (Table 3.13) (Pfeiffer, 1992; Iacovou et al., 1995).

**Table 3.13: Benefits Accrued from Adoption of EDI**

<b>Benefits</b>	<b>Reasons</b>
<b>Direct Benefits:</b>	
Enhanced cash flow	Labour savings; Exclusion of paperwork
Decreased transaction costs	Quicker exchange processing of information
Decreased inventory levels	Decreased ordering costs; quicker order cycle
Developed information quality	Increased accuracy and accessibility of information
<b>Indirect Benefits:</b>	Better information management and increased

Improved operational efficiency	internal operations due to time and cost reductions.
Improved customer service	Shorter lead times; more timely information about transaction status
Enhanced and expanded trading partner relationships	Enhanced trust through increased sharing of information; elimination of nuisance factors (e.g. errors in orders); increased ability to participate in Just-in-Time programmes
Strengthened ability to compete	Improved ability to go to new markets; improved ability to provide better service at a lower cost

Source: Adopted from Pfeiffer (1992) and Iacovou et al., 1995)

Iacovou et al., 1995 stated that small firms, with adequate financial resources, would be better prepared to utilise integrated EDI systems. Accordingly, firms, which had enough money to use unified EDI projects, were more likely to experience higher benefits from the use of that system. Approaching many international markets, which the firm could extend to through utilising e-commerce, would stimulate enlarging the variety of the products/ services in which the company dealt (Abell and Limm, 1996). Quayle (2002) found that the quantifiable benefits, which resulted from e-commerce, were such as reduced production costs; reduced administration costs; shorter order cycle. These were marginal in terms of direct earnings. As a result of previous studies' reviews and in order to complete the framework to investigate which could affect the adoption of e-commerce, direct and indirect benefits were used to explain this approach to adoption.

### **3.10 Gaps in Literature in Adopting E-commerce**

After reviewing previous studies on the adoption of innovation, with a specific focus on the Internet adoption and the adoption of e-commerce, some gaps were identified. The following section details these gaps as:

- 1- The majority of studies, conducted on SMEs, were in the context of developed countries and there were few empirical researches in developing countries despite the population, of these countries, contributing about 40% of the world population. This resulted in a lack of knowledge about the adoption of e-commerce environment in less developed and developing countries. Also, this led to a lack of capability to solve this sector's problems in utilising e-commerce.
- 2- Research concentrated mainly on the adoption of innovation from an individual approach and there were very few empirical studies conducted in the B2B context. Additionally, few researches focused on export and import SMEs since this sector dealt with international markets and was expected to have a different business environment. It was expected, also, that businesses' adoption of innovation would be influenced by different factors at different levels than those which affected individual adoption.
- 3- The literature on the adoption of technology and e-commerce revealed a large number of factors which could influence the adoption of innovation especially e-commerce. In addition, Zaltman, Duncan, and Holbek (1973) recognised over 21 characteristics or attributes of innovation, which were concluded mainly from previous studies on the adoption and diffusion of innovation. Therefore, this suggested that more researches, on the adoption of innovation, were needed. Also, different factors need to be investigated with different levels of adoption.

- 4- There were a few Egyptian studies on the adoption of innovation and, especially, on the adoption of e-commerce; however these empirical studies focused mainly on the B2c context. Rashid and Al Sahouly (2012); Shoib and Jones (2003) conducted studies on the factors which influenced Egyptian customers to adopt e-commerce. However, El-Gohary (2011) studied the factor which affected Egyptian tourism firms' adoption of e-marketing. These studies tried to investigate the adoption factors but none studied the factors which affected the adoption of e-commerce in the SMEs sector. Consequently, in order to try and give a more detailed picture about which factors applied in the Egyptian environment, there was a need for more researches to study the factors which affected the Egyptian SMEs' adoption of e-commerce .

### **3.11 Summary**

This chapter tried to provide an informed view about previous studies on firms' adoption of innovation by indicating that the adoption and implementation of innovation were characterised and measured using different approaches. There was, also, a lack of well-known measures for measuring the adoption of e-commerce and the diffusion between SMEs which could characterise the nature of e-commerce practice. Another evaluation, of previous researches on the adoption of e-commerce, was that the adoption processes were examined repeatedly on an individual basis. There was a literature review of the classification of the factors which influenced the adoption of innovation. These factors were catalogued as individual factors; innovation characteristics; organisation characteristics; e-readiness; government support; and e-commerce barriers. The next chapter discusses and forms the conceptual framework for adopting e-commerce through utilising the theoretical framework of the theory of diffusion of Innovations; the Technology Acceptance Model (TAM); and the resource-based view of the firm (RBV).

# **Chapter Four**

## **Theoretical Framework**

## **4.0 Introduction:**

The previous two chapters reviewed the narrated literature relating to the adoption of innovation and, especially, the adoption of e-commerce. These studies investigated the nature of the adoption of innovation, especially the adoption of e-commerce, by utilizing different theories and models of innovation. This chapter reconsiders the theoretical framework of handling the adoption of information technology to determine the conceptual framework of this study. This was done in order to investigate the relationship between the variables which had a relationship with the adoption of e-commerce. These variables were classified as individual characteristics; organisational characteristics; innovation characteristics; e-readiness; government support; and e-commerce barriers.

## **4.1 Theories of Adoption of Innovation**

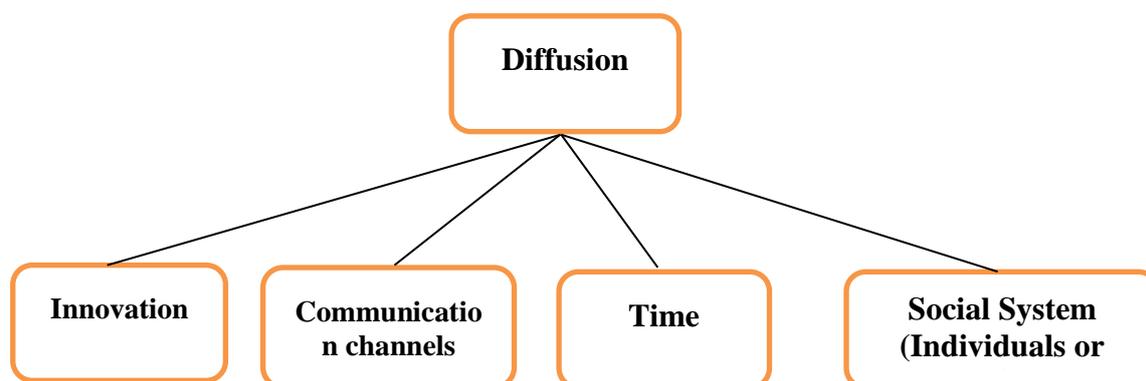
There are various theories and models have been used in IS research (Wade and Hulland, 2004). This section highlights how the process of the technological innovation adoption could be utilized<sup>84</sup> since there were no points, to develop the conceptual framework of this study, before understanding which theories were utilized in the adoption of innovation process. The conceptual model was based on four dimensions of theories, namely, Diffusion of Innovation (DOI); Resource-based-view (RBV) of the firm; Technology–Organization–Environment (TOE) Model; and Technology Acceptance Model (TAM).

### **4.1.1 Theory of the Diffusion of Innovation (DOI)**

In the context of the adoption of innovation, this theory was one of the influential theories. In the 1950s, Rogers (1983) defined it in studies of the extension of agriculture with regard to performing individual aspects of the adoption of innovation adoption in rural areas (Backer,

19991). Afterwards, the research moved on to address the organization's capability to act in response and adapt to external and/or internal modifications (Hull and Hage 1982). Rogers (1983, p11) defined innovation as an idea; practice; or an object which was identified as new by either an individual or other unit of adoption. Denning (2004) defined innovation as: 'an alteration of practice'. In a community, there was a distinguishable difference between the meaning of 'innovation' and 'invention'. Carayannis et al., (2006) mentioned that, 'Invention is the expansion of a new idea that has beneficial implementation. Innovation is a more complicated expression, indicating to how an invention is transported into commercial usage'. Newell and Turner (2006) presented the concept as the degree to which individuals would have to adjust their current practices as a result of the innovation. They stated that: "Innovation means change: sometimes radical change and sometimes incremental change". However, Roger's (1983, p11) defined the diffusion as the process by which an innovation was acted, over time, through communication channels between social system individual members or units of adoption. Therefore, the diffusion occurred through interaction between four elements:

**Figure 4.1: Diffusion elements**



Source: Rogers (1983, p.11-27)

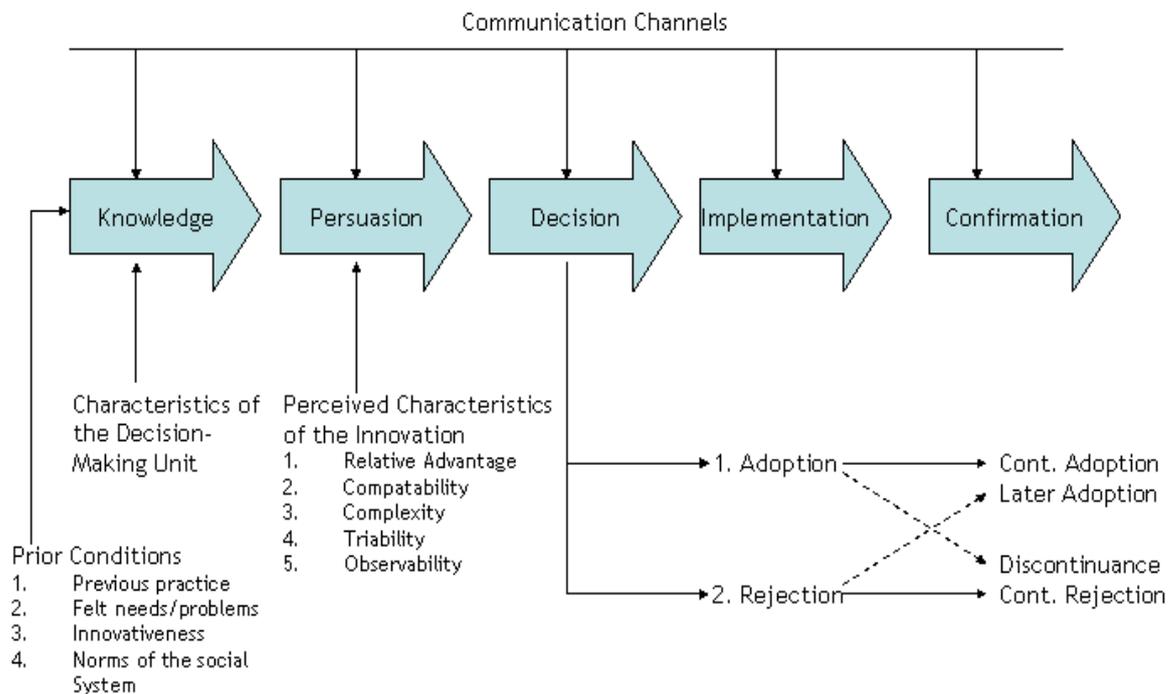
In diffusion, these elements could be described as following:

<b>Element</b>	<b>Definition</b>
Innovation	“An idea, practice, or object that is identified as new by an individual or other unit of adoption” (Rogers, 1983. P11)
Communication channels	“The medium that transfer messages from one individual to another” (Rogers, 1983. P17)
Time	“The length of time which is required to pass through the innovation-decision process” (Rogers, 1983. P21).
Social System	“A set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Rogers, 1983. P27)

#### **4.1.2 The Model of the Innovation-Decision Process**

The innovation process became a significant route with the increased recent attention concentrating on the adoption of technological innovation. The concerning issues about the adoption decision was not the choice between adoption or rejection but the choice of quick adoption or postponing the adoption until later. Rogers’s model of innovation adoption was utilised to study different types of innovations. This model was grounded on the process which an individual followed in leading to the final decision concerning the adoption of a new innovation. At beginning of this theory (1962), Rogers formed five stages which were, namely, awareness; interest; evaluation; trial; and adoption. These were fundamental to this theory. In line with the rapid change in information technology, Rogers changed the nomenclature of the five phases to: knowledge; persuasion; decision (accept or reject); implementation; and confirmation. Please see Figure 4.2 (Rogers, 1983, P. 165).

**Figure 4.2: Five Stages model in the innovation-decision process**



Source: Rogers (1983, p.165)

As illustrated in Figure 4.2, the innovation-decision process contained the following 5 stages:

**Knowledge:** this stage happened when a prospective adopter gained information about an innovation and understood its function and how it worked. In this stage, mass communication channels had an important role in delivering the correct information to the potential adopters. This stage influenced, also, the decision making unit's characteristics such as socio-economic characteristics; personal variables; and communication behaviour (Rogers, 1983, p.166).

**Persuasion:** or satisfaction, this was the stage in which an individual shaped his/her attitude towards the innovation. This attitude might be positive or negative with regard

to the innovation. In this stage, the innovation's characteristics, as perceived by the individual, namely, relative advantage; compatibility; complexity; trial ability; and observation, played a major part in the adoption decision (Rogers, 1983, p.170).

**Decision:** this stage took place when an individual was involved in some actions which guided making a choice between accepting or rejecting the innovation. Acceptance was a decision to consider and make full use of an innovation with the best available resources. However, rejection was the decision not to consider the innovation and, therefore, not adopt it (Rogers, 1983, p.173).

**Implementation:** This happened when an individual decided to use an innovation and try to use and organise different data or ideas to put it into practice. The most common problem might occur at the implementation stage; this was when the adopter missed how to use the innovation (Rogers, 1983, p.174).

**Confirmation:** this stage took place when the individual settled on his/her decision to continue to use the innovation. It was possibly that cognitive dissonance happened if the individual was challenged with conflicting implications about the innovation (Rogers, 1983, p.184).

Therefore, the innovation-decision process was the route which an individual went through from knowledge of an innovation; to creating an attitude regarding the innovation; to a decision to adopt or reject; to operate the new idea; and to confirm this decision. These phases were based on a series of motivations and choices over the time in which an individual or organisations assessed the new idea and decided whether or not to incorporate the new idea into on-going practice (Rogers, 1983, p.163). It was noteworthy to reference that researchers used Rogers's innovation-decision process model widely to form an acceptable framework in studying the adoption and diffusion of technological innovation as well as e-commerce. Accordingly, knowledge, of the presence of an innovation, could produce

motivation for its adoption (Rogers, 1983, p.166). The decision to adopt an innovation resulted fully in a positive relationship between the perceived attribute on innovation (such as relative advantage) and the rate of continuance (Rogers, 1983, p.214).

### **4.1.3 Innovation Characteristics**

As mentioned in the previous section, that decision stage was the phase of accepting or rejecting the adoption of the innovation. An innovation's attributes had an influential role on the direction of the decision. Rogers defined these characteristics, which affected an individual decision, through five determinants: relative advantage; compatibility; complexity; trial ability; and observation.

**Relative Advantage** referred to how an innovation developed over the previous version of an idea and the degree of relative advantage was expressed frequently in economic profitability or cost-effectiveness (Rogers, 1983, p.213). It occurred when the innovation was developed and adapted in several environments; consequently, it became more attractive to a wider series of adopters (Nelson et al 2002).

**Compatibility** referred to the level at which an innovation had to be integrated into an individual's life; this was known, also, known as how consistent it was with past experiences and the needs of potential adopters. This was connected, also, with the sociocultural values and beliefs. An idea which was less contrary with values and beliefs the more it was adopted by optional adopters (Rogers, 1983, p.223).

**Complexity** referred to whether or not an innovation was perceived to be complicated to understand and use if the latter, the individual would be unlikely to adopt it. In their contexts, some innovations were easily understandable to potential adopters while

others were not. Previous studies found that the complexity of an innovation related negatively to the rate of adoption of this innovation (Rogers, 1983, p.230).

**Trialability** referred to how easily the innovation could be trialled by a potential adopter. In the main, new ideas, which could be tested on the series of plans, would be adopted more quickly than innovations which were inseparable (Rogers, 1983, p.231).

**Observation** referred to which level the results, of an innovation, could be visible to other potential adopters. A more observable innovation would provide communication between individuals and personal networks and, consequently, would generate more positive consequences (Rogers, 1983, p.232).

#### **4.1.4 Model of Rates of Adoption**

The rate of adoption of the innovation was explained mostly by its perceived attributes (Rogers, 1983, p.211). The rate of adoption was described as the relative speed in which an individual or members of unit adopted an innovation. It was measured usually by the period of time required, for a specific ratio of the members of a social system, to adopt an innovation (Rogers, 1983, p.232). The rate of adoption was controlled by the individual category; as early adopter consumed less time than a late adopter to adopt an innovation (Rogers, 1983, p.235). Rogers mentioned that innovativeness was the degree to which, compared to other members of a social system, an individual or any other unit adopted new ideas at a fairly early stage (Rogers, 1983, p.36). Therefore, he defined, on the basis of innovativeness, an adopter category as a categorisation of individuals within an adoption system (Rogers, 1983, p.242). As shown in Figure 4.3, these categories of adopters were: innovators; early adopters; early majority; late majority; and laggards (Rogers, 1983, p.246).

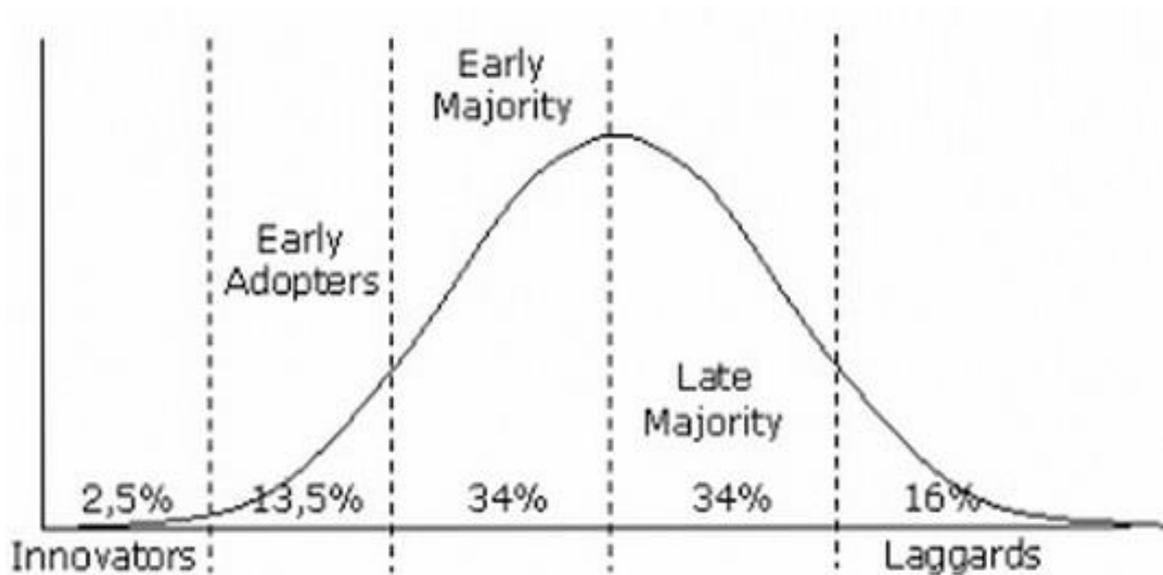
**Innovators** were the first individuals to adopt an innovation and, mostly, were adventurous. This type of adopters had to be able to deal with the high level of uncertainty, at that time, about the new innovation. Generally, they were young; had adequate financial resources; and were willing to take risks (Rogers, 1983, p.248).

**Early Adopters** were the second category of individuals who adopted an innovation and they were considered to be respectable. These individuals were younger in age; had more financial lucidity; had advanced education; and had a higher degree of opinionated leadership between the other adopter categories. Well-judged adoption would help them to support the central communication position (Rogers, 1983, p.249).

**Early Majority** described the individuals, in this category, who adopted after studying the innovation from different sides following a variety of periods of time. They were slower in the adoption process and cooperated with their partners; however, rarely, they held leadership positions.

**Early Majority** afforded interconnectivity in the system's networks. Consequently, they had a unique position amongst very early and the relatively late adopters (Rogers, 1983, p.249).

**Figure 4.3 Adopter Categorisation on the Basis on Innovativeness**



Source: Rogers (1983, p.247)

**Late Majority** referred to individuals, in this category, who would adopt an innovation after the average member of the social system. These individuals attempted to adopt an innovation with a high degree of suspicion and after the greater part of society adopted the innovation. They were characterised by scepticism about an innovation; had very little financial resources; had very little opinionated leadership; and were connected to others in the early majority (Rogers, 1983, p.250).

**Laggards:** referred to individuals, in this category, who were the last to adopt an innovation. They had a tendency to concentrate on "traditions". Unlike the individuals of the earlier categories, they had no opinionated leadership; tended to be older in age; had the fewest financial resources; were likely to have lowest social class; and be in contact only with family and close friends (Rogers, 1983, p.250).

In the beginning, Rogers's theory of adoption of innovation, with its models of the innovation-decision process and rates of adoption, were used to study the adoption of

innovation for individual behaviours. However, with the increase of the organisational role in economics, researches were directed to investigate the suitability of this theory especially within an organisation these researches focused on the decision makers in the firms. This interest increased with the explosion in information technology and how it participated in changing communities.

The main limitations, to Rogers's theory of adoption of innovation, was that he built a set of stages which described the diffusion process and he explained the factors, which could influence the adoption process, in general terms. However, he did not specify which factors could affect each stage of the adoption process since many studies showed that every stage of the adoption of technological innovation had its own factors which, in the end, were affected by the degree of the adoption. For example, in studying small businesses' adoption of information systems, Thong (1999) found that the factors which influenced the extent of the companies' adoption were rather different from the factors which influenced their likelihood of adoption.

Some studies found that the adoption of new innovation, particularly e-commerce, was affected by some external factors rather than organisational characteristics and related to the characteristics of the old technology which innovation ought to replace. Rather than Rogers' factors, some studies mentioned more factors which could influence the adoption of innovation. These were: organizational readiness; external pressure (Iacovou et al., 1995); variable environmental characteristics; and external support. These had an important role in rural small businesses' adopting new information technologies in (Premkumar and Roberts, 1999).

## **4.2 Resource-Based View of the firm (RBV)**

Resource-based view (RBV) received the attention from the 1980s onwards. Teece (1984), Rumelt (1984) and Wernerfelt (1984) contributed to RBV with their works to explain competitive advantage theory. Nowadays, the resource-based view had developed and become an influential framework in organisational innovation literature. It was matched by concerned concepts between firm's resources; performance; (Wright et al., 1994) and dynamic capabilities (Teece et al., 1997). Barney (1991) mentioned that firms achieved competitive advantage from owning resources which supplied them with unique bases of competitive advantage. These resources could be the firm's characteristics including assets; capabilities; information; knowledge; and organisational practices.

In order to improve assets, a firm had to increase and accrue fixed assets which could be valuable sources of continued competitive advantage if, also, they were uncommon and unique (Barney, 1991). Assets were described as perceptible or imperceptible resources which the firm could utilise as procedures to produce products/services and to offer them to the market (Sanchez et al., 1996). Conner (1991) explained that capabilities and resources were believed to be a result of the firm's resource commitments and strategic choices, and were directed by an economic motivation and by an intention of efficiency and productivity. Capabilities were defined as repeatable plans of activities to operate assets in order to create product/services for a market (Sanchez et al., 1996).

It was important to understand that firm's characteristics was not the whole story since we ought to pay attention to the fact that resource choice and utilisation were affected, also, by other factors such as the technological environment; industry structure; and competitors' activities (Amit and Shoemaker, 1993). Also, it was important to understand if there was a relationship between innovation and the firm's characteristics (e.g. specialisation; formalisation) and industrial environment. It was emphasised that innovation, related to the

firm's innovation characteristics, were explained mainly by organisational and industry structure characteristics (Damanpour, 1991; Daft, 1992; Wolfe, 1994). Organisational innovation was considered to be a combination of internal factors (assets; capability) and external factors (environmental characteristics).

In order to discover the value of the firm's resource based view for the adoption of e-commerce, it was essential to understand the attributes of resources which could lead them to be significant in the sustainability advantage. In order to identify a firm's resources attributes, Barney (1991) and Hitt et al., (2001b) suggested a set of four attributes which the resource had to have in order to be considered an advantage creator. These were: ability to be valuable; rareness; individuality; and non-substitutability.

Consequently, it was important when studying factors, which influenced an organisation's adoption of technology, to investigate the relationship between the organisation characteristics (such as assets; capability) and the adoption of innovation, specifically, the adoption of e-commerce.

### **4.3 Theoretical Linkages and Empirical Evidence**

Accessibility to financial resources could increase a firm's capability to promote its innovative behaviours (Delcanto and Gonzalez 1999; Lee et al., 2001); however, the lack of financial sources could affect negatively the level of the firm's innovation (Helfat, 1997; Teece and Pisano, 1994). Technical resources (production facilities; IT systems; IT infrastructure) were discovered, also, to influence positively the adoption of innovation (Lynn et al., 1999; Mitchell & Zmud 1999).

The important role, of intangible assets, guided the firm's increasing knowledge-based view (KBV) as an extension of the resources knowledge-based (RBV). As a strategic resource,

Knowledge-based view (KBV) was an important determinant of the firm's competitive success (Decarolis and Deeds, 1999; Nonaka, 1994). In order to keep this significant role, they had to be based on creating new ideas to encourage innovative behaviours, and to inspect their technological improvements against other competitors (Leonard-Barton, 1995).

Marketing abilities seemed to be important for the implementation of innovation. Many studies found a positive relationship between innovation and marketing capabilities (Song et al., 1997; Hultink et al., 2000; Benedetto et al., 2008). There was, also, a study on UK agri-food firms' adoption of the Internet. Simmons et al. (2007) studied the firms' marketing capabilities to investigate if there was a relationship with the business' adoption of the Internet. Moreover, the more effective capability of the firm's marketing interaction, the more acceleration of innovation procedures and obtaining successful innovation outputs (Souder & Jenssen, 1999).

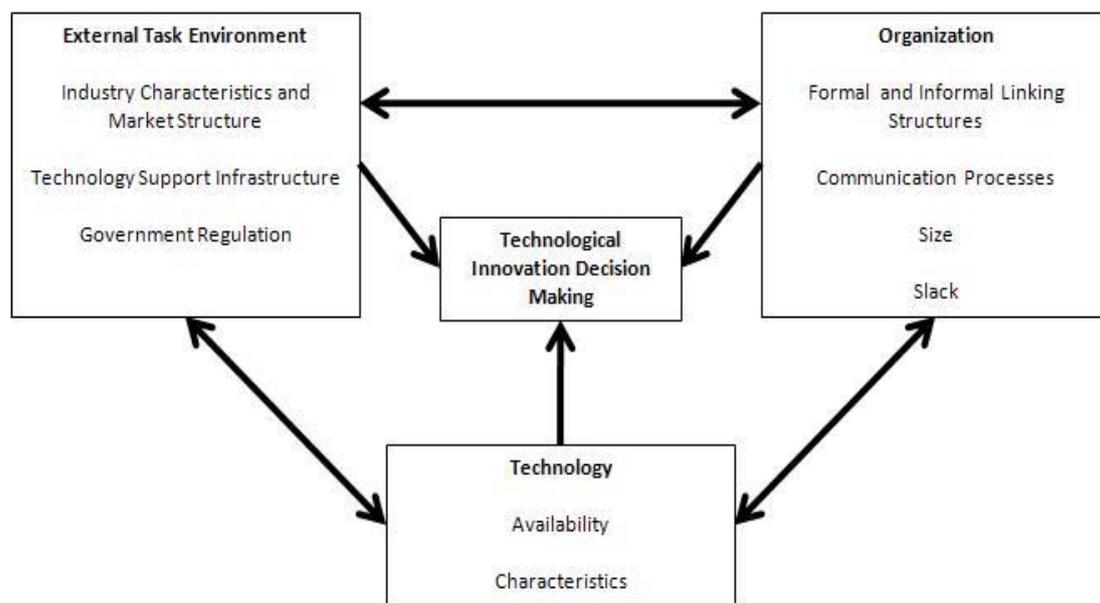
In the context of this study, the organisational characteristics included: firm assets; firm size; industry type; and marketing capabilities. These were addressed to explore the importance of these characteristics on the development of innovation.

#### **4.4 Technology–Organization–Environment (TOE)**

This framework received the attention since Tornatzky and Fleischer's (1990) have devolved it as processes of technological innovation. The TOE explains that three different aspects of a firm's environment influence the decision of adoption and these elements are *the environmental context, the organizational context, and the technological context*. This framework has been studied by several empirical studies on technological innovations (Iacovou et al., 1995; Thong, 1999; Kuan and Chau, 2001; Scupola, 2003).

The technological context refers to the external and internal and technologies that are related to the organisation and this contain both the firm equipment and its processes (Souitaris, 2002). The organizational aspect includes the resources and the characteristics of the firm, namely, human resources, the firm’s size, the firm’s formalization situation, managerial structure, and connections between employees (Steensma and Corley, 2001). The environmental context embraces the governing environment, the firm’s competitor’s pressures, the size and structure of the industry, and the macroeconomic context (Covin and Covin, 1990) figure 4.4 (Tornatzky and Fleisher 1990).

**Figure 4.4 the Technology–Organization–Environment (TOE) Model**



Source: (Tornatzky and Fleisher 1990)

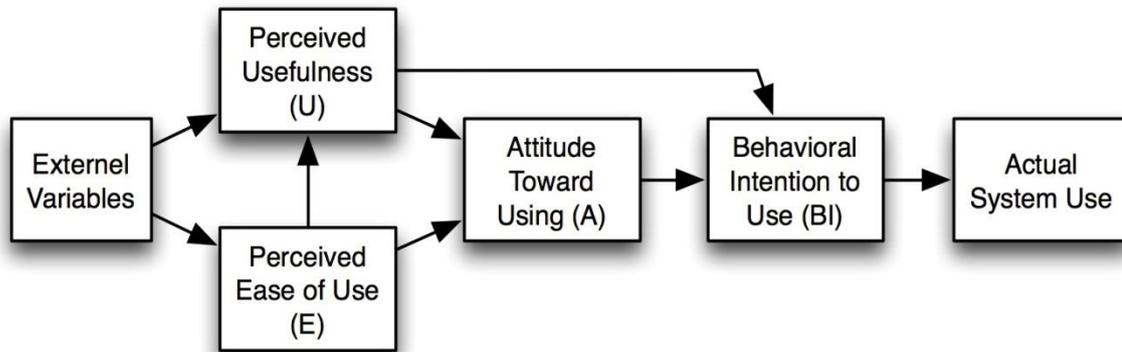
Several studies have adopted TOE framework to study the different factors that may influence the adoption of IT for example Thong (1999) have used TOE in integration with the DOI theory to study the adoption of IS by small firms. He formed a proposed model of CEO characteristics, IS characteristics and Organizational characteristics. With the same approach

Wang et al.,(2010) also have investigated Radio frequency identification (RFID) in the manufacturing industry. They examined the Technological context (relative advantage; complexity; compatibility), Organizational context (top management support; firm size; technology competence); and Environmental context (competitive pressure; trading partner pressure; information intensity). However, since its initial there are lack of development to TOE as it characterised that its factors has a high degree of freedom and this may explain why it is widely adopted in the innovation approach (Baker, 2012,p. 237).

#### **4.5 Technology Acceptance Models (TAM)**

It became one of the most challenging issues, in Information Systems (IS) studies, as to why individuals accepted or rejected computers (Swanson 1988). The technology acceptance model was counted as an extension to the analysis of the theory of innovation diffusion (Wixom and Todd, 2005). The innovation theory explained diffusion of innovation from a broad approach. However, TAM explained the adoption of technology with flexible paradigms which were more amenable to the context of operationalization and empirical testing which affected individual's behaviours concerning the adoption (Porter and Donthu, 2006). Davis (1986) introduced TAM firstly as an adaption of the Theory of Reasoned Action (TRA) to demonstrate user acceptance of information systems. TAM's main target was to introduce an explanation of the impact of external factors on the internal values; opinions; and plans (Davis et al, 1988). When considering cost and outcome in an adoption study, the TAM was considered to be the preferred choice of models since it gave details about differences in attitude toward accepting technology (Mathieson, 1991; Taylor and Todd, 1995). The two main principle beliefs, introduced in TAM, were: *perceived usefulness*; and *perceived ease of use* (Figure 4.4).

**Figure 4.5 the Technology Acceptance Model (TAM)**



Source: Davis (1989).

Perceived usefulness (U) was the benefits t which potential users expected of a specific application system and which would increase his/her career performance within an organisational perspective. Perceived ease of use (EOU) indicated the level to which the potential user assumed the adopted system would be free of effort (Davis et al, 1988). However, in practice, restrictions such as unintentional habits; time; and organisational limits would restrict the freedom to act.

Earlier research indicated that perceived usefulness was considered to be a significant determining factor of the reasons to use computers in the organisation (Ma et al., 2005). Although ease-of-use was a significant factor, for a system's usage , the system's usefulness was even more significant (Davis et al., 1989). Managers, with negative attitudes concerning computers, were less motivated to adopt new technology (Davis et al., 1992; Igarria et al., 1994).

Recently, some studies used TAM to investigate factors which influenced SMEs' adoption of e-commerce (Cloete, 2002; Grandon and Pearson, 2004; Khalifa and Davison, 2006; Parker

and Castlema, 2009). They were used, also, to study the adoption of IT adoption within SMEs (Anderson and Schwager, 2004; Riemenschneider and Harrison, 2003).

Over time, TAM was explained and developed continually and was verified and confirmed by many researches for examining users' behaviour towards technology acceptance. However, it had some limitations which reduced its efficiency to investigate the adoption of IT.

One of TAM's most common limitations was its very simplicity and stinginess (Chau et al., 2001). Benbasat and Barki indicated that TAM diverted researchers' attention away from other important research issues and created an illusion of progress in the accumulation of knowledge. Another limitation was that TAM focused on the concept of perceived usefulness and factors which explained the usefulness of individual behaviours in using computers. However, it ignored, fundamentally, the social processes of IS development such as the social values of IS use and their implementation (Bagozzi, 2007).

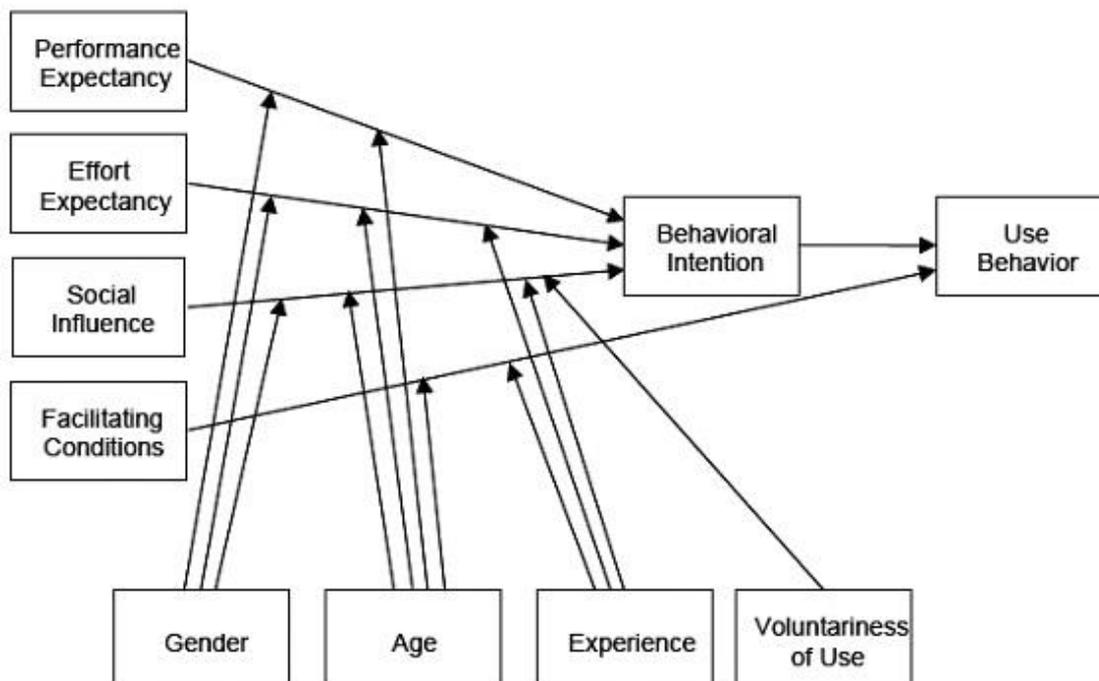
Structured studies such as Davis et al., (1989); Pavlou, (2003); Porter and Donthu, (2006), adopted TAM, as a theoretical fundamental, and aimed to focus on the individual consumer's attitude and behaviour in accepting IT. All focused mainly on the individual behaviours and attitudes and not on the organisational acceptance of IT. This research aimed to investigate organisational adoption of e-commerce and, more specifically, within SMEs.

Finally, previous studies did not consider factors related to explaining the demographic variances in Internet use and did not reflect related access barriers and, in particular, the cost (Porter and Donthu, 2006).

## 4.6 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model, constructed by Venkatesh et al, (2003), was an extension of the TAM. This model was intended to explain the user's objectives in using an information system and the resultant behaviour after acceptance. This model was based of four theoretical fundamentals: "*social influence; facilitating conditions; effort expectancy; and performance expectancy*"). These were considered to be the determinants of technology usage intention and behaviour. It was suggested that age; gender; experience; and voluntary use acted as a go-between the four key determinants on usage behaviour and intention (Figure 4.5) (Venkatesh et al, 2003).

**Figure 4.6: The Unified Theory of Acceptance and Use of Technology**



Source: Venkatesh et al. (2003)

Eckhardt et al.'s study of German companies, (2009) used UTAUT to investigate the workplace's social influence on the adoption of technology. They found that the workplace influenced significantly the social impact of adopting information technology.

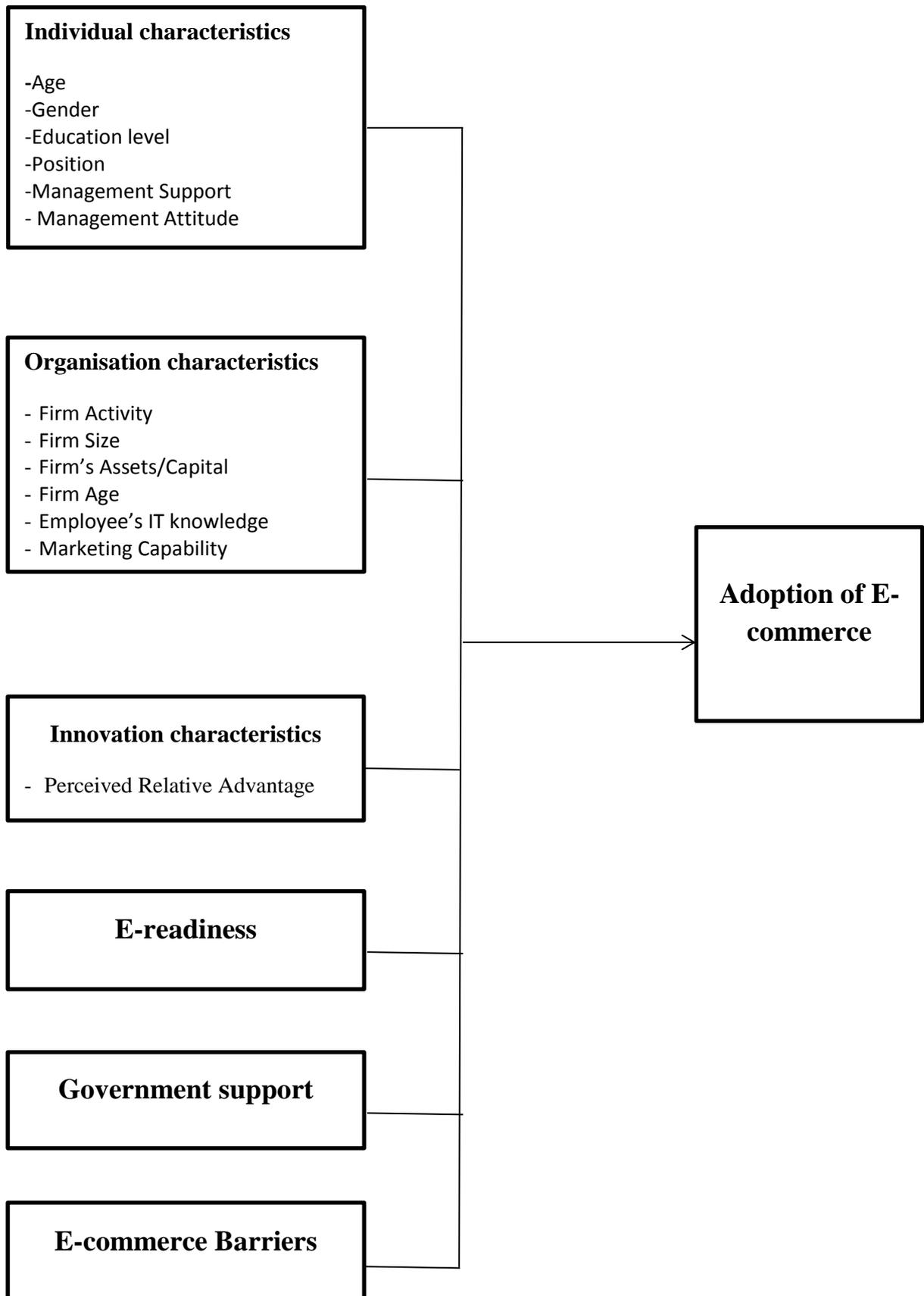
Similar to TAM, UTAUT highlighted the importance of individual's intentions and behaviours concerning the acceptance of technology by adding more variables to investigate their impact on these intentions and behaviours.

However, this model aimed, also, to investigate individuals as a base fundamental. However, this study tried to investigate SMEs' adoption of e-commerce.

#### **4.7 Proposed Conceptual Model**

Based on the discussion in the earlier sections, the research proposed model, shown in Figure 4.7, was structured to combine all aspects and variables. This model was an amalgamation of Theory of Diffusion of Innovation (DOI); the Resource-based View of the firm (RBV); Technology–Organization–Environment (TOE) Model; Technology Acceptance Model (TAM). As discussed earlier in this chapter, the theory of adoption of innovation was based on decision maker practice including the innovation attribute and the decision maker's characteristics. This proposed model was based, also, on previous empirical studies on the adoption of technological innovations and, especially, the adoption of e-commerce. This proposed model aimed to focus on the factors which influenced the SMEs' adoption of e-commerce. In more detail, there were six groups of factors which were expected to affect the SMEs' adoption of e-commerce SMEs. These factors were: individual characteristics; organisational characteristics; innovation characteristics; e-readiness; government support; and barriers to e-commerce.

**Figure 4.7: Modified Conceptual Model of the Factors Affecting the SMEs' Adoption of E-commerce**



Individual factors referred to the demographic characteristics of the organisational decision makers (age; gender; education level; position) and whether or not they accepted the adoption and at what level they supported the adoption. These factors were adopted from the Diffusion of Innovation (DOI). Organisational characteristics referred to the firm's resources (activity; size, owned assets/capital; age) and the firm's ability (employee's IT knowledge; marketing capability) to be able to innovate. These factors were adopted from Resource-Based-view (RBV). Innovation characteristics indicated the attributes of the innovation itself (e-commerce) as perceived by the organisation (perceived relative advantage). These factors were adopted from the Diffusion of Innovation (DOI). E-readiness dealt with individual e-readiness and enterprise e-readiness. These factors were adopted from the Technology–Organization–Environment (TOE). Government support referred to the level of support which the firm received from either individuals or from the government. These factors were adopted from the Technology–Organization–Environment (TOE). Barriers to e-commerce dealt with the factors which could impede individuals or an organisation adopting e-commerce. These factors were adopted from the Technology Acceptance Model (TAM) as external variables that may influence the adoption of e-commerce.

#### **4.8 The Development of Hypotheses of the Research**

Chapter one discussed the literature review on Internet and e-commerce. Chapter two to focused more on empirical previous studies on the adoption of innovation and, especially, technological adoption including e-commerce. Then chapter three set up the theories which were the fundamental bases in studying the factors which impacted on the adopting of innovation. This was done by discussing the theory of Diffusion Of Innovation (DOI); Resource Based View of the firm (RBV); the Technology–Organization–Environment (TOE)

framework; and the Technology Acceptance Model (TAM). All combined to help this study to identify the research gap and, as a result, participated in forming this study's proposed conceptual framework to fill the gap of previous studies. In order to create the proposed model (Figure 4.6) the researcher formed six groups of factors to investigate this conceptual framework. These factors were expressed by different hypotheses to emphasis this model's validity. These hypotheses are described in the following table:

**Table 4.1 Proposed Research Hypotheses**

	<b>Individual Characteristics</b>
<b>H1</b>	The older the decision maker, the more negatively disposed to the adoption of e-commerce.
<b>H2</b>	The decision maker's gender has an impact on the adoption of e-commerce.
<b>H3</b>	The higher education level of decision maker, the greater possibility of the adoption of e-commerce.
<b>H4</b>	The higher position of the decision maker in the firm, the increased possibility of the adoption of e-commerce.
<b>H5</b>	Proactive decision makers are more likely to adopt e-commerce than reactive ones.
<b>H6</b>	Having positive attitude towards change results in more positive disposition towards the adoption of e-commerce.
	<b>Organisational Characteristics</b>
<b>H7</b>	The types of products/services determine the level of adoption of e-commerce.
<b>H8</b>	The larger the firm, the more likely the adoption of e-commerce.
<b>H9</b>	The more assets in the firm, the more likely the adoption of e-commerce.
<b>H10</b>	The more experience in the market, the more likely the adoption of e-commerce.
<b>H11</b>	The higher IT knowledge of employees, the increased possibility of e-commerce adoption.
<b>H12</b>	Increased use of internet marketing is associated with higher levels of e-commerce adoption.
	<b>E-commerce Characteristics</b>

<b>H13</b>	Increasing geographical distance within a B2B relationship relates to a higher chance of e-commerce adoption.
<b>H14</b>	The more availability of communication tools the higher the possibility of e-commerce adoption.
<b>H15</b>	Increasing levels of research by the company are associated with the higher levels of e-commerce adoption.
<b>H16</b>	The more the company engages in future strategies, the more likely it is to adopt e-commerce.
<b>H17</b>	Higher usage of B2B relationships result in increased levels of e-commerce adoption.
<b>H18</b>	The more tasks involved, the more likely the firm is to adopt e-commerce.
	<b>E-readiness</b>
<b>H19</b>	The more e-ready the firm is the more it is likely to adopt e-commerce.
	<b>Government Support</b>
<b>H20</b>	Increasing levels of government support result in increased levels of e-commerce adoption.
	<b>E-commerce Barriers</b>
<b>H21</b>	The more barriers the more negative the impact on the adoption of e-commerce.

## 4.9 Summary

This chapter introduced the framework for SMEs' adoption of e-commerce. This framework was based on previous empirical research with the integration of theory of innovation diffusion; the Resource-based view of the firm, and the Technology Acceptance Model (TAM). The theory of innovation diffusion included Rogers's innovation-decision model and the rates of adoption model had a significant influence on the sensed innovation characteristics and the individual attributes which affected the adoption of innovation. The resource-based view of the firm (RBV) referred to the firm's resources and the firm's ability to adopt a new innovation such as e-commerce. The Technology–Organization–Environment (TOE) framework contains of three elements which are the environmental context, the organizational context, and the technological context. The Technology Acceptance Model

(TAM) dealt with the perceived usefulness of adopting new technology. Therefore, this chapter participated in the second research objective of developing the proposed conceptual framework. This proposed model supposed that there were six groups of determinants which influenced the SMEs' adoption of e-commerce. These factors were individual factors; organisational characteristics; innovation characteristics; e-readiness government support; and barriers to e-commerce. Twenty one hypotheses were developed to investigate the relationship of each of these constructs and the adoption of e-commerce.

The next chapter discusses the methodology applied in this study. Consequently, the next chapter attempts to justify and clarify the approaches used in this research by, firstly, defining the research methodology and, then, explaining the selected research method and the design of the study.

# **Chapter Five**

## **Research Methodology**

## **5.0 Introductions**

Many of developing countries attempted to follow the rapid development in information technology infrastructure in supporting new and creative implementations such as e-commerce, particularly in SMEs. However, when applied to developing countries, there were very few researches linked to the adoption of e-commerce.

This thesis' first four chapters reviewed a wide range of the body of knowledge of the chosen research area of study. This chapter aims to explain the research methodology employed in this study. It explains the research design and methods in association with the research objectives. This research's main aim was to discover the factors which affected the SMEs' adoption of e-commerce in developing countries such as Egypt, where very few studies, about in this approach, had been performed. However the choice, of an appropriate method, depended on a number of factors and phases. This chapter discusses the research methodology processes and pattern and divides them into four main sections, namely, research concept; research context; research philosophy; and analysis of the research approach.

### **5.1 Research philosophy**

A research philosophy refers to the contacted way in which data about a phenomenon should be collected, investigated and utilised. The research philosophy that the researcher adopts contains significant ideas about the way in which he/she understand the world (Johnson and Clark, 2006). When deciding on such a particular research methodology, the arguments tend to centre on the positivist against humanist or interpretivist argument although some research designs contain mixed methods (Heather, 1992). The first thinking supposes that reality is external and objective and that truth exists; however the second thought assumes that the

world is subjective and there is no permanent truth (Brown, 1996). The main impact of the adopted research method is likely to be the researcher's particular view of the relationship between knowledge and the process by which it is developed.

### **5.1.1 Positivist**

Positivist mainly focused on quantitative research methods (Saunders et al, 2009). Positivists suppose that reality is steady and can be examined and explained from an objective perspective (Levin, 1988). To create a research approach to gather these data the researchers are expected to use existing theory to develop hypotheses. These hypotheses will be examined and verified, as a whole or part, or disproved, guiding the expanded development of theory which then may be examined by further research (Saunders et al, 2009). It is believed that the researcher is independent of the subject of the research and neither affects nor is affected by it (Remenyi et al. 1998:33). Large sample surveys are handled and the focus is on the reliability of information in addition to validity (Anderson, 2003).

### **5.1.2 Interpretivism**

This paradigm is the opposite of positivism (Bryman, 2001). Interpretivism assumes that, even though the real world cannot be directly expressed by individuals senses, but their illustration of their knowledge of the studied world is significant in its own right (Burrell & Morgan, 1979,p. 28). In terms of the researcher's interpretation of the data, interpretivism methodology intend to understand what is happening in the context of the phenomenon under investigation (Carson et al., 2001). Interpretivism thought involves a number of phases, starting with a research questions rather than hypotheses then exploratory investigation and finally personal involvement in the phenomenon (Saunders et al, 2009).

Burrell and Morgan (1979, p 6) assumed that the choice of particular approaches and what the researcher see and think in the research are inspired by 'human nature'. Subjective

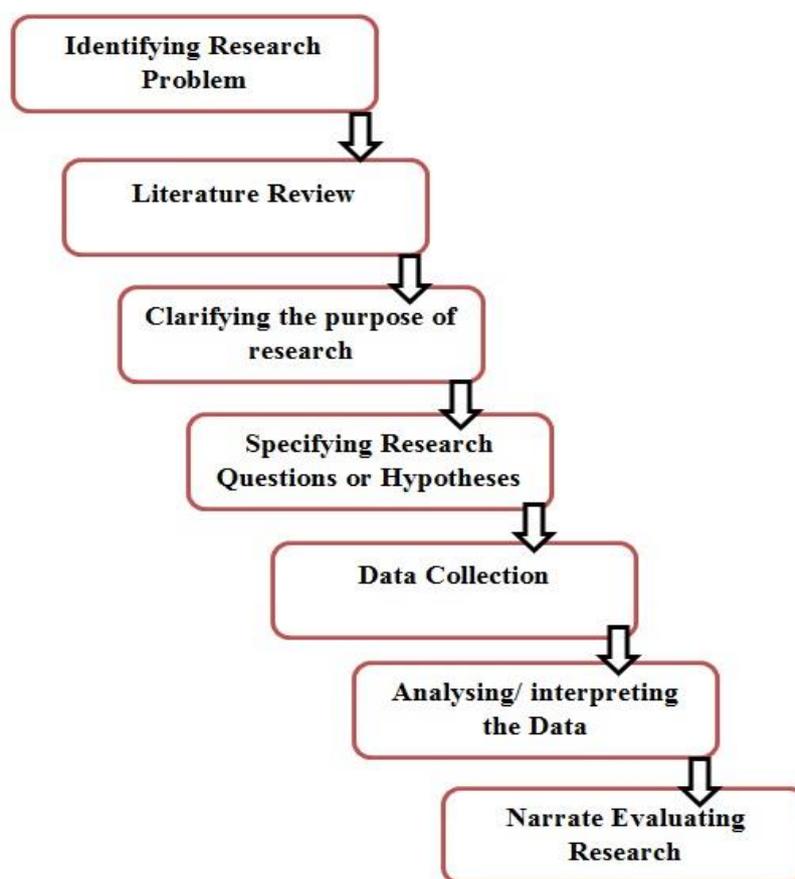
meanings and social phenomena are the main factors of interpretivism. It focuses on the details of situation, a reality behind these details and the individual attitude can motivate the action of the investigation (Saunders et al, 2009).

By observing the B2B e-commerce adoption by Egyptian SMEs and provide credible data, facts and try to focus on causality and generalisation he decided to follow the positivist though by adopting a quantitative approach to achieve this study objective.

## **5.2 Research Methodology**

Research is described as the formation of new knowledge by using existing information or facts in a new creative approach to generate new concepts; methodologies; and understandings of such phenomena (Anderson, 2004. p6). However, Creswell (2008. p10) defined the research as a development of steps used to collect and analyse information in order to increase the body of knowledge of a problematic area. It involved three steps: propose a question; collect data; and give an answer to the question. The most popular deception of the 'research' term, mentioned by Walliman (2005, p.8), was that, as shown in Figure 5.1, it was the systematic process of investigating a phenomenon and resulted in new findings.

**Figure 5.1: Research Processes**



Source: Walliman (2005, p.26)

This gives an overview of the major research phases, whatever the size of the planned study. More than its nature, the size, of the study, would influence the extent of the different stages.

## **5.2 Research Methods**

The adopted technique, to conduct the research, was called the methodology which was a recommended structure in trying to solve a problem with particular machineries such as, tasks: techniques; methods; and tools (Irny and Rose, 2005).

The literature showed the diversity of available methodologies which, linked to particular research topics, could help with the creation of data and information. Patton (1990) indicated

that it was very critical for the researchers to determine, firstly, which approach could detect the most suitable solution relating to the investigation phenomena.

There were two major types of research methods: quantitative research; and qualitative research. Researchers chose either of these methods depending on the nature of the research area which they wanted to examine and they targeted their research questions with the aim of answering the hypotheses under investigation

### **5.2.1 Qualitative Research**

Qualitative research was defined as understanding human behaviour and the reasons which controlled such behaviour. This was based on asking broad questions; collecting data in different forms; and reporting analysed information (Creswell, 1994). Usually, this type of research aimed to investigate a question without trying to consider the potential relationships amongst variables or quantifiably measured variables. It was viewed as more restrictive in testing hypotheses because it could be expensive and time consuming and, therefore it was limited, typically, to a single set of research subjects (Naoum, 1999). Qualitative research was used repeatedly as a method of investigative research and as a foundation for later quantitative research hypotheses (Denzin, 1994). Qualitative research could be used to describe a case which could not be measured by a quantifiable approach (Malhotra and Birks, 2000, p.157). Qualitative skills were particularly beneficial when studying a subject which was too complicated to be answered by a simple yes or no proposition. Methods, of the data collected in qualitative research, could be direct, such as interviews and group discussions, or indirect such as observation and reflection notes; various texts; pictures; and other materials (Malhotra and Birks, 2000, p.160).

## **Advantages**

These types, of research methods, had many advantages. Their design was much easier to plan and perform in comparison to quantitative types (Bryman, 2006). They were valuable, also, when research costs had to be taken into account. The wider scope, covered by these designs, could report unproven hypotheses, in the quantitative techniques, in order to ensure the usefulness of generated data. Unlike quantitative methods, qualitative research methods were not dependent on sample sizes. For example; a case study could generate significant results from analysing a small sample group (Malhotra and Birks, 2000, p.180).

## **Disadvantages**

Qualitative methods required a lot of careful planning and design in order to ensure that the obtained results were as truthful as possible. Another downside was that it could not be analysed mathematically in the same wide-ranging way as quantitative analysis (Sandelowski, 1986). Also, it tended more to personal belief and judgment. Consequently, it gave observations rather than results (Merriam, 2002). Overload data was another drawback of this type since open-ended questions could generate occasionally a lot of data; this could cost a lot of time and money to analyse. In addition, qualitative data was characterised as being unique and could not be reconstructed exactly; this meant the lack of ability to be repeated (Malhotra and Birks, 2000, p.182).

## **5.2.2 Quantitative Research**

This type of research referred to the use of statistical; mathematical; or computational techniques to investigate social phenomena empirically by developing and employing theories; hypotheses and/or mathematical models related to the phenomena (Bryman, 2006; Given, 2008). Moreover, Johns and Lee-Ross (1998, p.72) defined quantitative research, in

industrial management, as the selection of statistical materials, connected to social strategies, which delivered an illustration of how our society was changing. Often, the opened data was analysed by means of statistics with the assistance of computerised software (Morgan, 1998). The studied files, of this type of research, were characterised to be random. The quantitative design ought to employ only one variable at a time since, otherwise, statistical analysis became weighty and uncertain (Sale et al, 2002). In order to achieve effective problem solving by using this type, the researcher needed to validate the used method; utilise an appropriate model whenever possible; and be concerned about the measurement being reached (Curwin and Slater, 2006, p.2). This type of research described the behaviour of individuals or organisations (Curwin and Slater, 2006, p.7). In quantitative research, the data collection methods could be content analysis or survey or experiment (Vogt, 2007).

### **Advantages**

Quantitative methods enabled the research to describe a social phenomenon and processes which were not directly noticeable. Their structure was standard across many scientific fields and disciplines. Its strategy was a good way of proving or disproving a hypothesis and settling results. Comprehensive answers could be reached from statistical analysis and the results could be discussed reasonably and published. It was more beneficial, also, for testing the results by a sequence of qualitative trials. This led to a final answer and focused on possible directions for future research (Malhotra and Birks, 2000, p.207-237).

### **Disadvantages**

Quantitative research was characterised as being expensive; needed a lot of time to perform; and, in comparison to qualitative methods, was more difficult. It was applicable only for quantifiable phenomena. There was a need for more attention and careful planning to control the randomisation of the sample. Generally, quantitative investigations needed a vast statistical analysis; this could be significantly difficult for non-mathematicians since the

majority of scientists were not statisticians. In addition, there were very sophisticated requirements for the successful statistical confirmation of results since any uncertain results required retesting and modification to the design. Compared to qualitative methods, this consumed more time (Thomas, 2003, p. 69-75).

### **5.3 Qualitative and Quantitative Researches**

Many researchers (Johns and Lee-Ross, 1998; Punch, 2005; Malhotra and Birks, 2000; Thomas, 2003; Corbetta, 2003) discussed the variances between quantitative and qualitative research. Punch (2005, p.56) stated that quantitative research was systematised and was characterised by theory led observation. However, qualitative research was open and interactive and was characterised by observation led theory. Identifying the difference in the nature of data between the quantitative and qualitative research, Punch (2005, p.56) argued that quantitative research data was empirical information in a fashion of numbers. This was generated and was characterised by a set of firm and standardised measurements whereas qualitative research data was empirical information which was not in a form of numbers and was characterised as being soft; deep; and rich.

Many researchers referred to the importance of employing both quantitative and qualitative research and, especially in a social context, they could be mixed in single research investigations (Patton, 1990; Naoum, 1999). However, Johns and Lee-Ross (1998) argued that the combination of quantitative and qualitative research was quantitative work organised by a hypothetical-deductive, positivistic framework which was inconsistent with the phenomenological approach of qualitative research. Often, the triangulation approach aimed to narrow the study situation. It raised, also, a problematic question which was how much, of

the venture, was research and how much was action. As explained by scholars, Table 5.1 details some differences between the two types of research.

**Table 5.1: Differences between Qualitative and Quantitative Researches**

	<b>Quantitative Research</b>	<b>Qualitative Research</b>
Aim / purpose	Measuring the incidence of various opinions in the target population  Quantifying data and generalising results	Understanding of a certain phenomena  Highlighting the setting of a problem to generate ideas and/or hypotheses for later quantitative investigation
Experiment Sample	Generally, a large number of sample Randomly chosen respondents.	Mostly a small number of samples Selectively chosen respondents
Data collection	Survey  Content analysis  Experiment	Interviews  Group discussions,  Observation
Data analysis	Statistical data	Non-statistical data
Result	Used to recommend some solutions of a problem	Exploratory and can give initial understanding as a base for further decision making.

Source: adopted from Johns and Lee-Ross, 1998; Malhotra and Birks, 2000; Curwin and Slater, 2006.

Therefore, the selection, of the research method, depended on the nature of the research problem and the research question which would result in how the researcher would answer the question to solve the problem (Johnson and Christensen, 2004).

## **5.4 The Adopted Research Methodology**

There was no direct best and fast research method which could be adopted to conduct such a research; however the selection, of the research method, depended on the research problem; research question; research objectives; and the type of data needed for the research (Yin, 2003; Zikmund, 2003). Additionally, the decision, to adopt such a research methodology, was basically a settlement between the available options and the possible choices (Zikmund, 2003). Usually, the availability of resources and skills, held by the researchers, impacted on the choice of the adopted research methodology.

This study's main objectives were to investigate which factors affected the SMEs' e adoption of e-commerce; what was the level of adoption; and why they were adopted. Pinsonneault and Kraemer (1993) claimed that quantitative research was considered to be well-matched for answering research questions about what, how and why. Whereas, Kaplan and Duchon (1988) argued that, in order to obtain answers to questions about how and why, qualitative methods were better in attempting to investigate this case.

Having considered the advantage and disadvantages of previous discussed research approaches; time and cost; variance in locations; and due to the nature of this research in investigating which factors influenced the Egyptian SMEs' adoption of e-commerce, the researcher chose to adopt a quantitative research approach as a first step to investigating this case in Egypt. This choice resulted from a lack of contextual studies in the same environment. Also, the researcher planned to use qualitative approach as a second step in validating the quantitative results. This would give a boarder and deeper picture about the Egyptian SMEs' adoption of e-commerce. Depending on the available options and possible choices, and the sample needed for this purpose, a large, survey would be the most suitable

research method which could be adopted for this study. Additionally, based on the research framework, discussed in chapter four, and the large number of firms, which were needed as a sample frame to represent the population of this study, with the differentiation in SMEs locations, it was perceived that the survey method would be the most beneficial method. It was believed, also, that the findings, from a survey analysis could be sourced from current general statements about the SMEs sector in Egypt.

## **5.5 Survey Strategies**

This study adopted the survey tool, since Malhotra and Birks (2000) claimed that some of the most common survey approaches were telephone interviews; face-to-face interviews; and mail surveys including Internet surveys.

### **5.5.1 Telephone Interviews**

A telephone interview referred to telephoning the sample of respondents and asking them a sequence of questions. This type was characterised by the coverage of a wide geographical range and, even, by international markets. Another advantage, of telephone interviewing, was the speed of data collection (Malhotra and Birks, 2000, p. 210).

However, the disadvantage, of telephone interviews, was the limited duration of the interview since much conversation time was required, especially for answering complicated question would be the results of the interview (Carr and Worth, 2001). A long telephone survey, especially with long distance calls, was relatively expensive (Malhotra and Birks, 2000, p. 210).

Consequently, telephone interviews were effective and more suitable for short and simple surveys. However, in this case, it was unsuitable because this study's survey was quite long and had some complicated questions.

### **5.5.2 Personal Face-to-Face Contact**

In order to collect data, personal face-to-face contact required respondents to be interviewed personally either at home or in the workplace. In business-to-business research, office face-to-face interviews were used greatly since these were more efficient than telephone interviews or mail surveys (Newman et al, 2002). The most common advantages, of this type of approach, were the creation of interaction between the interviewer and the respondents and it provided more control on the time and the pace of the interview. Also, another benefit, of using this approach, was the availability to clarify any complex topics within the survey. However, the disadvantage, of this approach, was that it consumed a huge amount of time and was very expensive especially when collecting data from a wide geographical region (Malhotra and Birks, 2000, p. 214).

### **5.5.3 Mail Survey**

Mail survey referred to collecting data through sending the survey either by ordinary mail or electronic mail or by both of them as part of an integrated approach. By using this type, the benefit, of interactive face-to-face interviews, was lost. Also the respondents answered the survey's questions depending on the written instructions and the covering letter to stimulate responses. Additionally, it was totally reliant on the respondent completing the survey. However, the most common advantage, of a mail survey, was saving time and cost especially with widespread geographical distances (Malhotra and Birks, 2000, p. 216). In online surveys, especially with international markets, the costs of sending e-mail surveys were

considerably less than sending surveys by postal mail or making telephone calls surveys. Also, compared to other survey methods, it had a relatively higher response rate since, unlike telephone interviews; the respondents could answer the questions in their own time (Wright, 2006).

## 5.6 Chosen Data Collection Method

The questionnaire survey process of remained basically the same regardless of whether or not the format comprised of semi-structured; closed; or open-ended questions (Oppenheim 1992). It was important to consider the validity and reliability of the chosen approach: the extent of the validity was the degree to which it measured what it was supposed to measure, whereas, reliability belonged to the extent to which a measurement gave consistent results (Perreault and Leigh 1989, Malhotra and Birks, 2000). However, the objectives, of such a research, needed to be identified clearly before deciding which research method ought to be adopted to achieve these purposes (Rosen 1991). The following Table 5.2 reviews the adopted research method against each objective in this study.

**Table 5.2: Adopted Research Methods**

<b>Objectives</b>	<b>Research approach</b>	<b>Outcomes</b>
Review Internet and e-commerce literature	Mixed methods	Chapter Two
Review Innovation adoption literature	Mixed methods	Chapter Three
Developing theoretical framework	Mixed methods	Chapter Four
Investigating the adopted framework	Quantitative method	Chapter Six and Seven
Developing the e-commerce adoption model	Mixed methods	Chapter Eight

Grounded on these objectives and dependent on the available options and possible choices the researcher decided to adopt a questionnaire to collect data for this study. This was because surveys, concerning attitudes and opinions, could be collected through well-structured questionnaires (Pinsonneault and Kraemer, 1993). Additionally, in the SMEs context, there were many studies, on the adoption of e-commerce, such as Lee et al., 2000; Pontikakis et al., 2005; and Al-Qirim, 2007; Oh et al, 2009, which utilised questionnaires as a research method in their collection of data.

Adopting an online questionnaire was believed to be the best option based on many reasons including: more effective in saving time and money; flexibility for respondents to answer the questionnaire in their own time; and the ability to reach as many target respondents especially with the wide geographical distribution. However, the absence of direct interaction, especially with the complex parts of the questionnaire, was one of the most common disadvantages of an online questionnaire. Also, the low response rate was another drawback of adopting an online questionnaire (Griffiths, 2005, Wright, 2006). However, to overcome these problems, subsequent phone calls to respondent could be made in order to stimulate the response rate. Also, by consuming less time and money, the face-to-face survey method of collecting data was found, also, to stimulate meaningfully the response rate when compared to other survey methods between business respondents (Newman et al, 2002).

Therefore, since the survey was intended to apply to a wide geographical area, the chosen method, of delivering the questionnaire, was a combination of email and web survey.

Subsequently, after meaningful efforts were made to stimulate the response rate, the face-to-face survey was adopted to overcome this problem.

## 5.7 Design of Questionnaire

Oppenheim (2000, 12) identified two common types of survey: the descriptive; and the analytic survey. The descriptive questionnaire dealt with 'how many' or 'what' proportion of questions. However, the analytic survey answered the 'why' question and was set up mainly to investigate the association between particular variables. In this study, the constructed survey contained mainly structured questions, with components of semi-structured and open-ended questions. The questionnaire included three types of questions: attitudinal; behavioural; and classification (Jenkins, Dillman, 1997). The structured questions would be assessed by Likert scale (DeVellis, 1991). The questionnaire avoided as much as possible sophisticated questions and uncommon sentences or words. Also, the questionnaire avoided double-barrelled items which covered two issues at once (Zikmund, 2003). A pre-test (Pilot Study), of the questionnaire, was carried out for many reasons. Clarification was one of the most popular purposes for conducting a pilot study since it sought more as regards the questionnaire's wording. Capturing the information reflected the perceptions and practice of those who were adopting e-commerce. Also, it was intended to clarify the questionnaire's appropriateness to the respondents.

The final draft, of the first design of questionnaire, was piloted to 4.7% or 45 SMEs from the final sample. A total of five questionnaires were returned after the first e-mailing, representing a response rate of 11.1 %. An e-mail reminder, which included the link to the web questionnaire, was sent, and two more questionnaires were received, reaching a total response rate of about 15.6 %. The return rate was regarded as low when compared to Molla and Licker's (2005) pilot study which achieved a 20% response rate. The pilot provided some feedback which was applied to the questionnaire until the final draft was reached. Later, this was issued as the basis for collecting the data for this study.

## 5.8 Sampling Approach and Data Collection

Since, in Egypt, there was no directory or formal database of SMEs' details, especially in identifying trade (export & import) and non-trade services, the researcher consulted some publications; organisations; and individuals in order to construct the population and the sample of the study.

<b>Publication/Organisation/Individual</b>	<b>Address</b>
The General Organization for Export and Import Control, Ministry of Industry and Foreign Trade	Electronic Building, Cairo International Air port Heliopolis, Cairo
International Trade Points, Ministry of Industry and Foreign Trade	1 <sup>st</sup> floor, Tower 6 Ministry of Finance Emtidad Ramsis, Nasr City Cairo
Trade key	<a href="http://egypt.tradekey.com/">http://egypt.tradekey.com/</a>
Yellow pages	<a href="http://www.yellowpages.com.eg/">http://www.yellowpages.com.eg/</a>

The most useful sources were the International trade point and Yellow pages since they held basic information about firms, for research purposes. A representative random sample (Creswell, 1994; Malhotra and Birks, 2000) of 950 businesses chosen from the lists and confirmation checking was repeated to confirm that the sample units were not repeated.

Collecting the data involved the purpose of the questionnaire along with a covering letter (Appendix A &B) which explained the study's objective to CEOs or owners or top management of 950 SMEs in Egypt. These categories were targeted because they were the decision makers in respect of SMEs' adoption of e-commerce (Molla and Licker, 2005). Personalised cover letters (Appendix A), were e-mailed to the SMEs' CEOs or owners or top

management which explained the purpose of the survey and presented a pledge of confidentiality. The letters explained, also, the study's importance and necessity. The follow-up reminders were an effective way in stimulating the response rate (Malhotra and Birks, 2000).

## **5.9 Data collection and The Egyptian revolution**

Since this research proposed in very early stage to study B2B e-commerce in SMEs in agricultural sector where export and import of agricultural products and to adopt triangulation methodology of questionnaires and in depth interviews, however, the data collection had many troubles which affected the whole process of this research and made change in the adopted methodology of this research.

The data collection started in August 2010 with very low response rate of the survey. The researcher continued to distribute more questionnaires on SMEs on a second stage of data collection which was started in November 2012 during this stage the Egyptian revolution took place on 25 Jan 2011. At this event the whole process of data collection has been stopped for about 6 months due to the unsettlement in Egypt during that time and majority on SMEs closed down for some reasons such as lack of financial support, insecurity in the country and not willing to take the risk and make new transactions during this time. By June 2011, the researcher continued the data collection process with many challenges as a lot of SMEs refused to answer the study survey as they admitted that they don't know the researcher and they can't give any information to someone they don't know specially at this time of the revolution as the government at that time advertised on the public TV to warn Egyptians of giving any information about the country to others they don't know. Due to these previous problems the researcher changed the direction of the research by focusing on SMEs sector which work in import and export without limiting to Agricultural products. Also

the researcher adopted quantitative methodology only due to the refusal of a lot of SMEs to go for in depth-interview due to unsettlement in the country.

### **5.10 Non-Response alignment**

Wright (2006) mentioned that non-response rate became a disquieting issue when the difference, between the perfect responded survey and who failed to respond, was statistically significant. This problem was common to mail surveys including online surveys; telephone; or face-to-face surveys (Malhotra and Birks, 2000; Wright, 2006). Non-response happened for different reasons, such as lack of knowledge or interest. During the data collection process, the 25 January 2011 Revolution took place in Egypt. During this time, the researcher contacted, by telephone, the firms, in the sample, to confirm the previous e-mail concerning the survey. However, the majority of Egyptian firms stopped their activities temporarily for about seven months until July 2011 when the county settled down and the firms restarted their activities. Although it was difficult to eliminate the non-response alignment, the researcher made every possible effort to stimulate the response rate. Follow-up reminder emails were sent six times to the firms with a gap of two weeks between each occasion. However, in view of the existing non-response rate bias and with a time consuming study cycle, the researcher moved to collect data by face-to-face contact. He visited the international trade point to hand in and collect surveys from an authorised representative and to add some confidence and seriousness to the study.

## 5.11 Questionnaire Contents

Based on the research, hypotheses were developed in chapter four, the survey questions were developed from the variables enclosed in these hypotheses and the incorporated variables discussed in Chapter four. Questions were adopted, from previous studies, which aimed to study the contexts of the adoption of technology (Harrison and Mykytyn, 1997). Various scales were utilised for most structures in order to increase the reliability of the measurement (Malhotra and Birks, 2000). There were three parts to the questionnaire's contents. The first part measured the dependent variable by identifying the perceived benefits and identifying, also, the level of adoption. The second part related to measuring the independent variables as outlined in the model. The final section collected descriptive information on the firms.

The questionnaire was structured as follows:

### 5.11.1 Dependent Variable

This part aimed to identify the dependent variable, of the study, by asking two questions. The first one was concerned to the level of adoption to identify at what level they engaged in e-commerce. This was done by asking about the nature of the firm's displayed data on the Internet.

<b>Statement</b>	<b>Source</b>
What is the nature of the data displayed about your company on the Internet?	Adopted from Lefebvre et al (2005)
What is the average of e-commerce sales in relation to the company's total sales?	Developed by the researcher

Due to the sensitivity of financial information about the firm and to improve the reliability of the research, the researcher developed another question to determine the benefits gained from adopting e-commerce.

<b>Statement</b>	<b>Source</b>
Here are some benefits which your firm should expect from adopting e-commerce. Please indicate the extent to which you agree or disagree with the following statements. Stimulated our Profits Improved our reliable/accessible ways of storing Fostering our customer relations Saving our time Saving our costs Increased our range of markets Increased our range of products Increased availability of information about goods / services Increased our deals Easy to start and manage a business	Adopted from Pfeiffer, 1992; Iacovou et al., 1995; Abell and Limm, 1996; Quayle 2002; Molla and Heeks, 2007
Increased our firm's ability to compete with other SMEs Facilitating our financial transactions (paying bills & .....) Gave our firm better control over information availability and reliability Gave us effective communications with trading partners	Developed by the researcher

### 5.11.2 Independent Variables

As discussed in the proposed model in chapter four, the independent variables were individual factors; innovation characteristics; organisation characteristics; e-readiness; government support; and barriers to e-commerce.

The following sections explain how each variable was measured.

#### Individual factors

Demographic factors were utilised to investigate whether or not these individual properties had an impact of the direction in adopting e-commerce .

<b>Statement</b>	<b>Source</b>
How old are you?	Developed by the researcher
What is your gender?	
What is the highest level of education you have completed	
What is your position in the company?	

However, variables, about the CEOs/top management's support and attitudes are explained in the following statements.

### **Top management support**

These three statements were asked to investigate whether or not the SMEs' CEOs/top management supported the idea of adopting e-commerce.

<b>Statement</b>	<b>Source</b>
The top management supports fervently the use of e-commerce.	Adopted from Iacovou et al, (1995), Montealegre, 1998, Molla and Licker, 2005
Top management is knowledgeable of the benefits of e-commerce on the firm's performance.	
The top management allocates the needed resources to develop e-commerce within the company.	

### **Top Management Attitude toward change**

These three statements were asked to identify the SMEs' CEOs/top managements' attitudes towards the changes which the adoption of e-commerce would bring to the firm.

<b>Statement</b>	<b>Source</b>
Top management is aware that e-commerce will enhance our company.	Adopted from Premkumar and Roberts, 1999; Corbitt, 2000; Fillis et al., (2004).
Top management is interested in being informed about new e-commerce developments.	
Top management is aware that e-commerce is not inconsistent with our cultural values/habits.	

## **Organisational Characteristics**

### **Firm Industry**

Firm industry referred to the type of products/service which the firm dealt with. This statement was used to identify whether or not the firm's activity related to technology and whether or not it would impact on its adoption .

<b>Statement</b>	<b>Source</b>
Under which industry can your company be classified?	Developed by the researcher

### **Firm Size**

In this study, firm size was measured by the firm's number of employees as expressed by the following statements.

<b>Statement</b>	<b>Source</b>
How many people does your business employ?	Adopted from Pohlen, 1996; Fillis et al., 2003.

### **Firm capital**

Firm capital referred to the availability of financial resources and to measure whether or not such availability was associated with the adoption of e-commerce.

<b>Statement</b>	<b>Source</b>
What is the capital volume of your firm?	Developed by the researcher

### **Firm age**

This referred to the firm's age by its number of years in the market.

<b>Statement</b>	<b>Source</b>
How long has your Business been operating?	Adopted from Thong, 1999

These statements were used to identify the respondents' opinions about the information technology knowledge of the firm's employees and whether or not the level of this awareness was associated with the addition of e-commerce.

### **IT knowledge**

<b>Statement</b>	<b>Source</b>
Our company employees are knowledgeable about information technology.	Adopted from Mirchandani and Motwani, 2001
Our company employees are experienced with computers.	
Our company has skilled technical support staff.	

### **Marketing Capability**

Three statements were used to determine the top management's capability to utilise marketing skills related to the necessities of e-commerce.

<b>Statement</b>	<b>Source</b>
Our company employees are knowledgeable about information technology.	Adopted from Day, 1994; Weerawardena, 2003; Simmons et al., 2007
Our company employees are experienced with computers.	
Our company has skilled technical support staff.	

### **Innovation Characteristics**

#### **Relative Advantage**

Six questions were used to measure the perceived relative advantage of e-commerce against traditional ways of trade, especially international trade. The responses, to these questions, were measured by using the five-point Likert scale.

<b>Statement</b>	<b>Source</b>
To what extent, does geographical distance affect your choice of international market?	Developed by the researcher
When deciding whether or not to adopt e-commerce, how important are the availability of the following communication tools?	Developed by the researcher
To what extent, do you agree with this statement: the availability of a wide range of e-commerce academic research stimulates the company to understand what is new in the e-commerce field?	Developed by the researcher
Will the company adopt a strategy to increase the use of electronic commerce in future?	Developed by the researcher
Which of the following relationships, do you consider are important to the long-term success of e-commerce in your business?	Developed by the researcher
Please provide your opinions regarding the impact of e-commerce on the performance of these tasks which have a role in the company.	Developed by the researcher

### **E-Readiness**

Six statements were used to measure the e-readiness of the environment surrounding the firm and to identify whether or not the level of e-readiness impacted on the adoption of e-commerce.

<b>Statement</b>	<b>Source</b>
Internet service providers are easily available.	Adopted from Rizk, 2004; Dada, 2006
Internet downloading/access speed is fast enough to cope with the global technology.	Adopted from Rizk, 2004; Dada, 2006
Setting up e-commerce is at discounted prices.	Adopted from Rizk, 2004; Dada, 2006
Technology equipment (computers) are at acceptable price levels.	Adopted from Rizk, 2004; Dada, 2006
E-commerce maintenance is available at reasonable costs.	Developed by the researcher
There is adequate security of the online payments process.	Developed by the researcher

## Government Support

Seven statements were used to measure the support which the company received from the government concerned with stimulating the adoption of e-commerce.

<b>Statement</b>	<b>Source</b>
The government offers grants/loans to SMEs to encourage the use of e-commerce.	Adopted from Wong (2003)
The government has plans and distinctive strategies to increase the SMEs' use of e-commerce.	Adopted from Wong (2003)
The government stimulates SMEs to increase their use of e-commerce.	Adopted from Wong (2003)
The government encourages the banking system to offer financial support for SMEs who adopt e-commerce.	Adopted from Tigre 2003
The government has a strong legislative and legal structure to control and regulate e-commerce.	Wong (2003)
Information and communication technology at a level that does encourage companies to adopt e-commerce.	Developed by the researcher
The government provides workshops / training to SMEs to inform them about the benefits of e-commerce for firms and the economy.	Developed by the researcher

## Barriers to E-commerce

Thirteen statements were used to identify whether or not the existence of barriers influenced the firm ability to adopt e-commerce.

Statement	Source
Many trade transactions still require the traditional method of trading.	Adopted from Lawrence, 1997; Purao and Cambell, 1998; Farmoohand et al, 2000; Keeling et al., 2000.
Slow completion of commercial transactions because of not using electronic means in all e-commerce phases.	
E-commerce needs some protocols with special conditions; these are difficult for companies to abide by.	
The government does not have plans and distinctive strategies to deal with e-commerce.	
The legislative and legal structures are not strong enough to control and regulate e-commerce.	
Information and communication technology is at a level which does not encourage companies to adopt e-commerce.	
The language differences affect the company's decisions in dealing with some foreign companies.	
Information technology tools are at a price level which does not help companies to modernize through the use of e-commerce	
The company's employees are not trained well enough to deal with e-commerce	
Local banks do not provide facilities for companies to encourage them to use e-commerce.	
There is little awareness of programs about e-commerce and its importance.	
There is a lack of trust between trading parties.	
There is a lack of racial confidentiality and security in using e-commerce.	

This research aimed, through empirical investigation. to identify the factors which influence the Egyptian SMEs' adoption of e-commerce. Descriptive concepts and critical review of previous studies were performed. Based on the problem, which the study identified, and the gap, in the literature, the objectives were formed for the purpose of directing this study. Subsequently, based on Rogers' Model of Adoption of Innovation (RMAR); the Technology

Acceptance Model (TAM); and the Resource-based view of the firm (RBV), a conceptual framework was developed to identify a proposed model of factors which could affect the adoption of e-commerce. Namely, these were: individual factors; organisational characteristics; innovation characteristics; e-readiness; government support; and barriers to e-commerce. In order to investigate this model, the appropriated questions were based on the research hypotheses which were grounded on the variables of the model. Based on available options and possible choices the data, to be collected, was determined and, then, the questionnaire was distributed to the firms in order to collect the necessary data for this study.

## **5.12 Summary**

This chapter reviewed the different research methodologies and focused especially on quantitative research methods. The survey method was found to be a suitable tool to achieve the proposed research objectives. The study implemented an online survey in view of its competence to collect data from a large number of SMEs and for the purpose of generalising the findings related to the adoption of e-commerce amongst SMEs. The advantages and disadvantages, of the selected research method, were addressed and actions to overcome the shortcomings were adopted. There was a discussion of the development of the survey instrument which was guided by the previous literature of good practice for designing a questionnaire. There was a discussion of the questionnaire's contents. This was based on the variables of the proposed model and was accompanied by an explanation of the type of questions and statements to be answered.

The next chapter discuss the analysis of the data; the results of the questionnaire; and analyses the findings. These results contained the descriptive findings of the profiles of the CEO/top management respondents and the profiles of the respondent SMEs. Also, there was an an explanation of the deductive statistical testing of the results.

# **Chapter Six**

## **Research Findings**

## **6.0 Contents:**

In the previous chapter, the nominated research method approach was discussed and justified. This chapter outlines the quantitative findings appropriate to the research problem and ensuing objectives by presenting and analysing the obtained data. It starts by providing a descriptive analysis of field study data of valid replies in accordance with classification of the study sample and tests the survey's degree of sincerity and consistency to judge the suitability. Then, the chapter presents the results of data analysis in relation to the testing of the hypothesis. Therefore, the researcher used the computer statistical program SPSS 18 to process the data.

### **6.0.1 Introduction**

Earlier in this thesis, the researcher presented the research introduction to the reader (chapter one); critically review the literature (chapters two and three); discussed the theoretical framework (chapters four); and highlighted the adopted methodological approach (chapter five). In this chapter, the research findings are shown. Submitting the adopted research method approach, a quantitative data was collected and, then, analysed by using SPSS. Figure 6.1 presents the findings.

**Figure 6.1: Chapter Six Outlines**



**(Source:** Adopted by the author)

### **6.0.2 Data Collection and Analysis**

The data, for this research, was collected in two parts. The first part was the pilot study (Crouch and Housden, 2003: 272) collected at an early stage of this research. The researcher distributed about 10 questionnaires, on different exporting and importing SMEs in Cairo, to identify an initial direction about the research subject and to establish if there were sufficient grounds to continue with the research. The second part, of the data collection, involved the

distribution of 950 questionnaires to Export and Import SMEs in Cairo; these companies were the main source of data in carrying out the research.

## 6.1 Survey Response

From a total of 950 questionnaires, distributed to small and medium enterprises (SMEs) in Cairo, 137 responses were received. However, 7 responses were unusable and were removed from analysis. In view of there being some significant changes to the pilot study questionnaires, the responses, were excluded from the final total of questionnaires for analysis. In total, there were 137 final responses which represented a 14.4% response rate (Table 6.1). The response rate was assessed using the method recommended by De Vaus (2002: 97). The overall response rate was higher than the 11.8% rate obtained by Daniel et al. (2002) who conducted a study on the adoption of e-commerce by UK SMEs. Also the number of responses was greater than the 42 responses received by Le and Koh (2002) who conducted study about e-commerce development in Malaysia.

**Table 6.1: Summary of Survey Responses**

<b>Data Collection</b>	<b>Number of Surveys</b>
Forms distributed (including pilot study)	950
Forms from pilot study	5
Forms returned from survey	137
Unusable Forms	7
Usable Forms from survey	130
<b>Total usable questionnaires for analysis</b>	<b>130 (13.7 %)</b>

**(Source:** Collected and calculated from the study field data)

## 6.2 Respondents Profile

This section states the background information and characteristics of the respondents to the study. This study's questions were related to gender; age; level of education; current position; their support for e-commerce; and attitudes towards change. The following sub-sections show and discuss the results.

### 6.2.1 Respondents Current Position

Table 6.2 shows that more than half of respondents were at senior management levels. These consisted of marketing managers (n=52, 40%); export/import managers (n=31, 23.8%); and IT /IS managers (n=8, 6.2%). However, the remaining respondents were either CEOs (n=17, 13.1%) or chairman of the board/proprietors (n=22, 16.9%) of SMEs. The high ranked levels of respondents delivered some indications on the validity of responses since, generally, respondents, from senior management levels in SMEs, could be expected to be more knowledgeable about their firm's e-commerce activities.

**Table 6.2: Respondent Current Position**

<b>Career</b>	<b>Frequency</b>	<b>Percentage</b>
Chairman of the Board	17	13.1
Executive director /managing director (CEO)	22	16.9
Marketing Manager	52	40.0
Export/ Import Manager	31	23.8
IT / IS Manager	8	6.2
<b>Total</b>	<b>130</b>	<b>100</b>

(Source: Collected and calculated from the study field data)

### 6.2.2 Respondent Age

Table 6.3 reveals that more than half (56.2 %) of the respondents were more than 40 years of age. The age profile indicated a great proportion of middle-aged CEOs or top management. The biggest category was in the 40-50 age brackets (47.7%), with the remaining 8.5% being above 50 years old. The results took into account that 33.1% of the SMEs were mature firms, more than 10 years old. It might suggest that many of the owners or CEOs, of SMEs, were, also, founders of their businesses, and had expanded them over the years.

**Table 6.3: Respondent Age**

Age	Frequency	Percentage
21- 30 years old	9	6.9
31- 40 years old	48	36.9
41 – 50 years old	62	47.7
Above 50 years old	11	8.5
<b>Total</b>	<b>130</b>	<b>100</b>

**(Source:** Collected and calculated from the study field data)

### 6.2.3 Respondents Gender

Figure 6.2 shows that the majority of the respondents, in the sample, were male (n= 105, 80.8%) and females represented less than 20% of the sample. CAPMAC (2012) announced that the Egyptian work force consisted mainly of 73.8% men and 26.2% women. On the evidence of this sample, the situation was unchanged.

#### 6.2.4 Respondents Education level

The respondents were asked about their educational credentials. Table 6.4 shows that the majority of the respondents had formal education beyond the secondary school level. CEOs or top management, with a university degree, managed about 62% of the SMEs and nearly 8% had gone beyond university degrees. This result suggested that, increasingly, graduates led SMEs in Egypt.

**Table 6.4: Respondent level of Education**

<b>Education level</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Master degree</b>	10	7.7
<b>BSc degree</b>	81	62.3
<b>College Degree</b>	38	29.2
<b>High school or equivalent</b>	1	0.8
<b>Total</b>	<b>130</b>	<b>%100</b>

(**Source:** Collected and calculated from the study field data)

#### 6.2.5 Top management support

Table 6.5 shows the mean values of e-commerce adopters which reflected the management's belief in and support of e-commerce use in the firm (mean= 3.98). Furthermore, they (mean= 3.87) were aware of the potential benefits of adopting e-commerce. However, some of them (mean= 3.85) might have plans to develop the use of e-commerce in the future. This suggested further that top management were more aware of the importance and benefits of e-

commerce on their companies and, consequently, allocated adequate resources to developing the e-commerce practice for that purpose.

**Table 6.5: Top management support**

<b>Top management support</b>	<b>Mean</b>	<b>Rank</b>
-The owner or manager has allocated adequate resources to development of e-commerce within the company	3.9769	1
-Top management is aware of the benefits of e-commerce on the firm performance	3.8692	2
-The owner or manager enthusiastically supports the use of e-commerce	3.8538	3

**(Source:** Collected and calculated from the study field data)

### **6.2.6 Top management attitude towards change**

Table 6.6 shows that e-commerce adopters had a positive attitude toward change and were willing to innovate. Being e-commerce adopters, these companies were more willing to hear about the e-commerce development (mean= 4.05). Also they believed that it enhanced their firms activity (mean= 4.04) and, at the same time, they considered still that, commonly, there was a cultural resistance toward change in Egypt (mean= 3.46) and that new ideas, like e-commerce, took a long time to be developed well.

**Table 6.6 Top management attitude towards change**

Top management attitude towards change	Mean	Rank
- I am interested to hear about new e-commerce developments	4.0538	1
- E-commerce has enhanced our company situation	4.0385	2
-We, in Egypt, have a cultural resistance toward new ideas such as e-commerce	3.4615	3

**(Source:** Collected and calculated from the study field data

### **6.3 Profile of Responding SMEs**

This section (section 6.3) provides background information on the SMEs which participated in the survey. The examined characteristics included the sector in which the firm operated; firm age; firm size; market orientation; and the length of time which the firm had used ecommerce.

#### **6.3.1 Sector**

Table 6.7 indicates that the sample came from different industry sectors; Food and beverages sector came first with about 22.31 % followed by Electrical and electronic sector with 18.5 % and, then, Agriculture, Forestry and Fishing sector with 13.9%. This indicates that most of respondents came mainly from Agriculture sector whether manufactured or non-manufactured products.

**Table 6.7: Sector of SMEs**

<b>Industry</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Agriculture, Forestry and Fishing</b>	<b>18</b>	<b>13.85</b>
<b>Construction</b>	<b>6</b>	<b>4.62</b>
<b>Electrical and electronic</b>	<b>24</b>	<b>18.46</b>
<b>Food and beverages</b>	<b>29</b>	<b>22.31</b>
<b>Plastic products</b>	<b>9</b>	<b>6.92</b>
<b>Textile and apparel</b>	<b>13</b>	<b>10.00</b>
<b>Wood-based products</b>	<b>14</b>	<b>10.77</b>
<b>Miscellaneous</b>	<b>17</b>	<b>13.08</b>
<b>Total</b>	<b>130</b>	<b>100</b>

(Source: Collected and calculated from the study field data)

### **6.3.2 Firm Age**

Table 6.8 demonstrates that over half (59.2%) of the SMEs had been in business between 5 to 10 years; a quarter (26.9%) had operated between 11 to 15 years. Overall, the outcomes showed that, in the sample, more than half (66.9%) of the SMEs, were more than ten years old, whilst about (6.2%) had been operating for more than 15 years. Only 9.6 % were founded less than five years ago. The result indicates that most of the responding SMEs were in the market for less than 10 years. This suggested that they did not have much accumulated experience in trade activity.

**Table 6.8: Firm Age**

<b>Year</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Less than 5 year</b>	<b>10</b>	<b>7.7</b>
<b>5-10 yrs</b>	<b>77</b>	<b>59.2</b>
<b>11-15 yrs</b>	<b>35</b>	<b>26.9</b>
<b>More than 15 yrs</b>	<b>8</b>	<b>6.2</b>
<b>Total</b>	<b>130</b>	<b>100</b>

(Source: Collected and calculated from the study field data)

### **6.3.3 Number of Employees**

Company size was determined by number of employees. Table 6.9 shows that 54.6%, of the sample, had fewer than 50 employees. According to the definition of SMEs adopted by CAPMAS (The Central agency for Public Mobilisation and Statistics in Egypt), these are small-sized SMEs. The remaining sample (45.4%) employed 51-99 employees and, therefore, was classified as a medium-sized enterprise.

**Table 6.9 Number of employees**

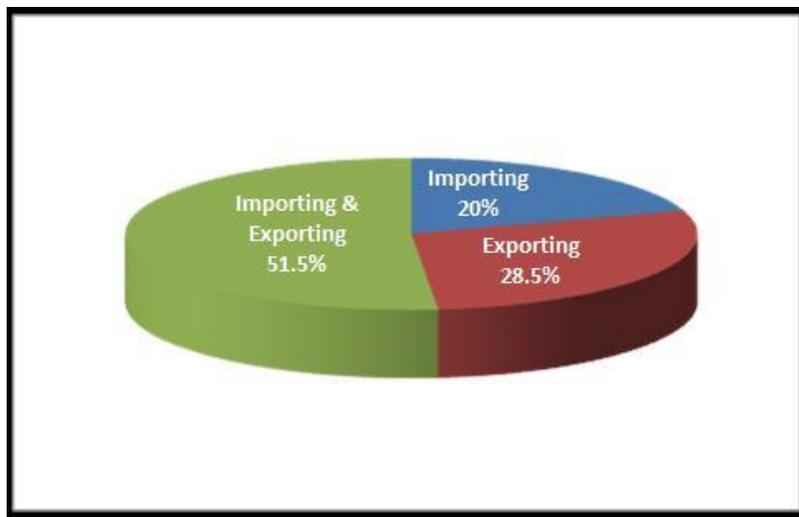
<b>Number of employees</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Fewer than 50 employee</b>	<b>71</b>	<b>54.6</b>
<b>50 – 99 employee</b>	<b>59</b>	<b>45.4</b>
<b>Total</b>	<b>130</b>	<b>100</b>

(Source: Collected and calculated from the study field data)

### 6.3.4 Market Orientation

As shown in Figure 6.2, more than half (51.5%), of SMEs in Egypt, practice both Export and Import activities, whilst only about a third (28.5%) exported their products to foreign markets and less than a quarter (20%) imported goods and services from international markets. The results suggested that, from both angles, SMEs had wide experience of international market challenges and requirements.

**Figure 6.2: Market Orientation**



(Source: Collected and calculated from the study field data)

### 6.3.5 Market Destinations

Geographical areas were selected and, as issued by the Egyptian Ministry of Industry & Foreign Trade, the questionnaire stated the information concerning the classification of specific markets. Respondents were asked to select the markets with which they traded currently. The results, in Table 5.10 indicate that they believed geographical distance had a significant effect on the selection process of export/import markets. Table 6.10 outlines the favoured destinations. The most popular destination markets, with 17.8%, were the Middle East (Saudi Arabia; Algeria; Syria; Sudan; Iraq; Morocco; Libya; UAE; Bahrain; Djibouti;

Jordan; Kuwait; Lebanon; Oman; Palestine; Qatar; and Tunisia). The results suggested that since, in the Middle East, the mother tongue language was Arabic, the different languages might have had some effect on the SMEs' decisions about which markets to deal with,. Since the majority of Egyptian imports came from China, with 15.6%, China was the second most popular destination.

**Table 6.10: Market Destinations**

<b>Destination Market</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Rank</b>
<b>Middle East</b>	57	17.76	1
<b>China</b>	50	15.58	2
<b>Africa</b>	38	11.84	3
<b>Turkey</b>	31	9.66	4
<b>Europe</b>	26	8.10	5
<b>Thailand</b>	21	6.54	6
<b>Japan</b>	16	4.98	7
<b>Taiwan</b>	14	4.36	8
<b>India</b>	11	3.43	9
<b>South Korea</b>	8	2.49	10=
<b>Malaysia</b>	8	2.49	10=
<b>Indonesia</b>	6	1.87	11
<b>Bangladesh</b>	5	1.56	12=
<b>Philippine</b>	5	1.56	12=
<b>Singapore</b>	5	1.56	12=
<b>USA &amp; Canada</b>	5	1.56	12=
<b>Hong Kong</b>	3	0.93	13=
<b>Pakistan</b>	3	0.93	13=
<b>Vietnam</b>	3	0.93	13=
<b>Australia</b>	2	0.62	14=
<b>Sri lanka</b>	2	0.62	14=

<b>North Korea</b>	1	0.31	15=
<b>South America</b>	1	0.31	15=

(**Source:** Collected and calculated from the study field data)

With 11.8%, Africa (Nigeria; Kenya; Somalia; Senegal; Ghana; Benin; Cameroon; South Africa; and Chad) was the third popular destination. Turkey came in with 9.7%. Furthermore, Europe (Italy; UK; France; Germany; Spain; Belgium; Russia; Netherlands; Switzerland; and Greece) came after Turkey with almost 10% of Egyptian SME destinations. From these results, it seemed that distance had, also, an effect on the choice of market.

### 6.3.7 Employees IT knowledge

This section highlights the firm's employee information technology background. It seemed that majority of SMEs staff could use computers to carry out firms' duties. As shown in Table 6.12, employees (mean = 4.02) had a high level of computer knowledge. Experience with information technology (mean = 3.68) was, also, quite high. However, there were fewer technical support staff employed (mean= 3.31). This might be reflected by the high cost of hiring qualified IT staff.

**Table 6.12: Employees IT knowledge**

<b>Employees IT knowledge</b>	<b>Mean</b>	<b>Rank</b>
- Our company employees are all computer literate	4.0154	1
- Our company employees are experienced with information technology	3.6769	2
- Our company has capable technical support staff	3.3077	3

(**Source:** Collected and calculated from the study field data)

### 6.3.8 Marketing capability

This section draws attention to firm's marketing ability as determined by distribution; promotion; and services development. Table 6.13 shows that the firm (mean= 4.054) could supply products online and offline too. Also, promotional offers (mean = 3.6) were ranked reasonably high. However, development marketing activity (mean = 3.59) was the lowest of the firm's capacities. These mean values indicated that SMEs needed to be more determined in understanding how to develop; promote, and distribute their services through e-commerce.

**Table 6.13: Marketing capability**

<b>Marketing capability</b>	<b>Mean</b>	<b>Rank</b>
- We are able to distribute our firm products online as well as offline	3.9846	1
- Our promotional activities (e.g. advertising) over the Internet are effective in gaining market share	3.6000	2
- We do a good job of developing new trading services over the Internet	3.5846	3

(**Source:** Collected and calculated from the study field data)

### 6.4 Access to International Market and E-commerce Experience

This section describes, from the sample of the SMEs, the firm's activity decisions and electronic commerce experience. The evolution and innovation, in information technology, contributed to dissolving the borders between countries and facilitated the exchange of goods and services. These resulted in improved methods of buying and selling (Cunningham & Foschl, 1999, p.45). The degree of growth, in the use of e-commerce, increased globally; however, the degree of increase varied from one country to another. For example, compared

to third world countries, developed countries were considered to have higher growth (Brich et al, 2000).

#### **6.4.1 International Market Advertising Methods**

This section highlights the methods which Egyptian SMEs used to advertise internationally their products to other SMEs. Respondents were asked about the methods which they adopted for marketing their products in the international markets. By far the most popular method was the international trade point (explain what) with more than three quarters (77.6%) of the sample having used this approach (Table 6.14). Results indicated, also, that the electronic catalogue was the second most popular approach (over 53.08 % of SMEs used this method as another choice). Many firms had begun to understand the potential advantage of information technology and were using, as a business tool, trading websites in the promotion of their products (40% of SMEs had adopted this method). Relationship marketing played a role between SMEs since about a third of the respondents used networking/personal contacts as a marketing tool to advertise their products for other parties. Furthermore, 25.38%, of the sample, used Trade directories and hard paper catalogues and 13.1% (n=17), of the sample, used international trade shows or exhibitions were utilised by. However, no firm, from the sample, had its own website; this was due to the high maintenance cost. A reasonable range of techniques were used but, by the highest margin, the international trade point outranked any other method. A small numbers of firms (7.69 % & 6.15% respectively) used other less common methods such as domestic export agents and foreign retailers.

**Table 6.14: International Market Advertising Methods**

<b>Advertising methods</b>	<b>Frequency</b>	<b>Percentage *</b>	<b>Rank</b>
-International Trade Point	101	77.69	1
- electronic catalogue	69	53.08	2
- Advertising/direct sale on trading websites.	52	40	3
- networking/personal contacts	43	33.08	4
-Trade directory	34	26.15	5
-hard paper catalogue	33	25.38	6
-Integrating social media	22	16.92	7
-International trade shows/exhibitions (Event marketing)	17	13.08	8
-Email marketing	16	12.31	9
-Pay-per-click ads	5	3.85	10
-The company's website	0	0	

(**Source:** Collected and calculated from the study field data)

\* Calculation done on the sample number (130 SMEs)

#### **6.4.2 Number of Years Using e-commerce**

The results, in Table 6.15, show that more than half of the responding SMEs (59.2 %) had used ecommerce for less than 3 years. Only 6.9% of the sample had more than 5 years electronic commerce experience. Compared with developed countries, e-commerce experiences were still at low levels and e-commerce was considered to be a new innovation.

**Table 6.15: Number of Years Using e-commerce**

<b>Activity</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 3 years	77	59.2
3 – 5 years	44	33.9
More than 5 years	9	6.9
<b>Total</b>	<b>130</b>	<b>100</b>

(**Source:** Collected and calculated from the study field data)

### 6.4.3 E-commerce level

Table 6.16 shows that all the Egyptian SMEs were only in the first 2 levels of e-commerce. However, more than three quarters of the responding SMEs (78.5 %) were using the second level of e-commerce (publishing the company’s basic information like address; telephone number; e-mail; and products information). This might refer to why the international trade point was the most popular advertising tools used by the Egyptian SMEs. However, the rest of the SMEs (21.5%) were using the first level which involved connecting to the Internet only through e-mail. The results suggested why, compared to some other less developed countries, the Egyptian SMEs' development of using e-commerce remained at a low level.

**Table 6.16 E-commerce level**

<b>E-commerce level</b>	<b>Frequency</b>	<b>Percentage</b>
Connected to internet with e-mail only	29	21.5
Publishing basic information (address, Email, fax, telephone number .....	101	78.5
Have a website accepting queries, e-mail, and form entry from users	0	-

Online selling purchasing of products	0	--
Integration with suppliers and other back office systems allowing transactions to be conducted electronically	0	-
<b>Total</b>	<b>130</b>	<b>100</b>

(Source: Collected and calculated from the study field data)

#### 6.4.4 Factors Influencing the Practise of E-commerce

The internet (mean = 4.20) (Table 6.17) was the most influential factor on e-commerce practice. The SME decision maker came into contact with a large number of buyers who might place orders through emails which was the third highest factor influencing the firm's activity (mean = 4.02). Depending on previous experience and purchases history, they preferred usually to deal with companies with whom they had dealt before. This was why networks, of personal costumers, were the second ranked factor affecting the firm's activity through e-commerce. Egyptian SMEs continued to use some traditional communications means with other firms. Fax (mean = 3.91) was the fourth highest factor. This was despite using trading websites and the advantages of EDI (Electronic Data Interchange) such as reducing process cycling time; reducing paper work; reducing data re-entry; improving customer services; increasing effectiveness; and increasing quality of the trading relationship (Tuñón et al, 2007). These were ranked lower since EDI was the fifth ranked factor (mean = 3.83) and trading websites was the sixth ranked factor (mean = 3.77) since, usually, SMEs employed these websites to publish their details to other companies who were already involved in export and import.

**Table 6.17: Factors Influence e-commerce practice**

<b>Factors</b>	<b>Mean</b>	<b>Rank</b>
Internet	4.2000	<b>1</b>
Network of personal contacts	4.1000	<b>2</b>
Email	4.0231	<b>3</b>
Fax	3.9077	<b>4</b>
Electronic Data Interchange	3.8308	<b>5</b>
Trading website where products and services can be ordered	3.7692	<b>6</b>
Information available shopping/Marketing sites	3.7538	<b>7</b>
Word of mouth	3.1615	<b>8</b>

(**Source:** Collected and calculated from the study field data)

#### **6.4.5 E-commerce benefits**

Web-enabled business-to-business (B2B) e-commerce was linked to the benefits obtained from adopting this type of technology and resulted in more turnover; cost savings; and effective communication with other businesses (Subramaniam and Shaw, 2002). Respondents were asked about the potential benefits of the firm as a result of e-commerce practices. Results, in Table 6.18, show that profits and greater numbers of deals (mean = 4.19) were equally the most important benefits to be gained in adopting e-commerce. Greater number of deals and further profits were the main target for any business operation and, therefore, it was not surprising to be the most important concern of the firm's strategy. Effective communications, with other businesses, and saving administration costs (mean = 4.17) were the second most important benefits which the firm was seeking since electronic commerce shortened the required time to complete a deal (the fifth expected benefit with mean = 4.16). This compared with the traditional trade system whereby, in order to make every new deal, the firm's representative had to travel from one country to another. This took not only some

days but took, also, some weeks to negotiate. However, in e-commerce, the firm's representative could negotiate many deals at the same time with lower cost, whilst he/ she stayed at the company without travelling abroad and, consequently, saved a lot of time and cost. For some businesses, gaining access to as many markets without moving abroad (mean = 4.15) was another benefit which encouraged top management to adopt e-commerce. In the case of firms wanting to go further afield, they needed more information about products/services and markets (mean = 4.08); this could be obtained through practicing e-commerce. Another aspect was financial transactions (mean = 4.07). Electronic transactions could reduce errors and create transaction databases which could be accessed at any time. It could minimise, also, fraud cases and it could be done at a lower cost than traditional transactions. Other benefits included increasing the number of goods, which the company distributed, and better control over information availability. E-commerce reduced, also, any business' operating costs.

**Table 6.18: E-commerce benefits**

<b>Benefits</b>	<b>Mean</b>	<b>Rank</b>
- Stimulating our Profits	4.1862	<b>1=</b>
- Increased our deals	4.1862	<b>1=</b>
- Gave us effective communications with trading partners	4.1735	<b>3=</b>
- Saving our costs	4.1735	<b>3=</b>
- Saving our time	4.1641	<b>5</b>
- Increased our range of markets	4.1562	<b>6</b>
- Raise the company's ability to compete	4.0952	<b>7</b>
- Facilitate Financial transactions (paying bills, paying tax)	4.0754	<b>8</b>
- Increase the number of goods that the company circulation	3.9423	<b>9</b>
- Increase availability of information about the goods / services	3.9214	<b>10</b>
- Give the firm better control over information availability and reliability	3.9022	<b>11</b>
- Easy to start and manage a business	3.8257	<b>12</b>

- Foster customer relations	3.6521	<b>13</b>
- Increase in reliable/accessible ways of storing	3.8155	<b>14</b>

(**Source:** Collected and calculated from the study field data)

#### **6.4.6 E-commerce Relationship.**

This section highlights, in practising e-commerce, the understanding of the importance of the relationship with other parts of the business environment. Respondents were asked to comment on the importance of various relationships in terms of developing a long term e-commerce success strategy (Table 6.19). The results show that the most important perceived relationship was business contacts, followed closely by the relationship with the suppliers of the products to other business companies. Distributors and banks were found, also, to be important in terms of business and e-commerce success. The connection with consultants was found to be of just above average importance, whilst those, concerning the bonds with government agencies, was deemed to be of relatively little importance.

**Table 6.19: Importance of Relationship for E-commerce Success.**

<b>Relationship</b>	<b>Mean</b>	<b>Rank</b>
<b>Business contacts</b>	3.9692	<b>1</b>
<b>Suppliers</b>	3.8462	<b>2</b>
<b>Distributors</b>	3.7923	<b>3</b>
<b>Banks</b>	3.7846	<b>4</b>
<b>Consultants</b>	3.6769	<b>5</b>
<b>Government agency</b>	3.4846	<b>6</b>
<b>Retailers</b>	3.2154	<b>7</b>

(**Source:** Collected and calculated from the study field data)

#### 6.4.7 E-commerce and the Performance of Firm's Tasks.

This section explores, in the SMEs, the importance of some tasks which have a relationship with e-commerce practice. Respondents were asked to highlight the importance of various tasks in terms of improving e-commerce practice strategy. This is outlined in table 6.20.

For the firms, in this study, marketing was the most important task connected with e-commerce practice. About two thirds of respondents saw e-commerce (n= 52, n=53, M= 4.21) affecting the firm's marketing performance. The company's strategy was the second most important task, with mean of 3.94, which was affected positively by the firm's e-commerce practice.

**Table 6.20: The Impact of e-commerce on the Firm's tasks performance**

Task	Mean	Rank
Marketing	4.2077	1
The company's strategy	3.9385	2
Information Technology	3.9308	3
distribution	3.9000	4
purchases	3.7385	5
Human Resources (work force )	3.6462	6
Funding/ financial resources	3.5308	7
Manufacturing, preparation and processing	3.4308	8

**(Source:** Collected and calculated from the study field data)

Information technology and distribution were important tasks (mean= 3.93, mean= 3.90) which the firm ought to consider when it used electronic commerce. However, some respondents indicated that, when they dealt with e-commerce (mean= 3.65, mean= 3.53) the firm's human resources and funding or financial resources were less important.

### 6.4.8 Government Support

Egyptian SMEs understood the government's vital role in supporting the adoption and practice of e-commerce. However, mean values, in Table 6.21, reflected the Egyptian government's low support of towards adopting e-commerce. They understood that the government had plans to encourage SMEs to adopt e-commerce (mean=2.577) and it had arranged some induction workshops (mean = 2.51) to emphasise e-commerce's vital role of in the national economy. In addition to making agreements with the bank system (mean = 2.41) to support e-commerce adopters financially, it encouraged, also, SMEs to diffuse e-commerce along with their activities (mean= 2.42). The government ought to have business strategies and an appropriate ICT (mean= 2.40), with strong legal structure (mean= 2.37), to activate the movement of e-commerce within SMEs so that they could keep pace with the development of the regional and global markets.

**Table 6.21: Government support**

<b>Government support</b>	<b>Mean</b>	<b>Rank</b>
- The government has plans and distinctive strategies to increase the use of e-commerce by SMEs	2.5769	1
- The government provides workshops / training SMEs to inform them with e-commerce benefits for firms and the economy.	2.5167	2
- The government stimulates SMEs to increase the use of e-commerce	2.4231	3
- The government encourages the bank system to offer financial support for SMEs who adopt e-commerce	2.4077	4
- Information and communication technology at a level that does encourage companies to adopt e-commerce	2.4001	5
- The government has a strong legislative and legal structure to control and regulate e-commerce.	2.3692	6
- The government offers grants/loans to SMEs to encourage the use of e-commerce	2.2738	7

(Source: Collected and calculated from the study field data)

### 6.4.9 E-readiness

Table 6.22 shows the Egyptian IT environment for adoption of e-commerce. Values reflected the e-commerce adopters' poor services when they practiced it in their firms. Good practice required easy internet access (mean= 3.55) at a discounted price (mean= 3.38) with equipment at acceptable prices (mean= 3.49) and a reasonable setting up cost (mean= 3.39). As a result of the developed world's tremendous advancements in successive communications and information technology in creating an improved e-commerce environment, Egyptian IT policy makers needed to pay more attention to improving information and communication infrastructure so that e-commerce services could be enhanced.

**Table 6.22: E-readiness**

<b>E-readiness</b>	<b>Mean</b>	<b>Rank</b>
- Internet service providers are easily available	3.5538	1
-Technology equipment's ( computers) are at acceptable price levels	3.4923	2
-E-commerce setting up at discounted prices	3.3785	3
-E-commerce maintenance at reasonable costs	3.3469	4
-Internet downloading/access speed is fast to cope with the global technology	3.0923	5
- Online payments process is securely adequate	2.8654	6

**(Source:** Collected and calculated from the study field data)

#### 6.4.10 Absence of e-commerce Strategies.

This section explores why Egyptian SMEs were unwilling to increase investment in practicing e-commerce in their companies. Traders were asked to indicate the reasons impacting on the use of e-commerce in their firms. This is outlined in Table 6.23 below.

**Table 6.23: Absence of e-commerce future strategies**

<b>Reasons</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Rank</b>
Lack of expertise at the company's employees	20	15.39	<b>1</b>
Fear of using e-commerce	17	13.08	<b>2</b>
Lack of support and motivation from top management	14	10.77	<b>3</b>
Included in the agenda of the company and has not yet begun	10	7.69	<b>4=</b>
The expected revenue from e-commerce is not commensurate with the size of investments required by it	8	6.15	<b>4=</b>
High cost on the company's budget	4	3.08	<b>6</b>
Not in the available internal resources	0	-	-
e-commerce is unrelated to the company activity	0	-	-

**(Source:** Collected and calculated from the study field data)

Less than one third of the respondents (n = 24, per cent = 13.08 %) indicated that, currently, they did not invest in increasing the company's use of e-commerce. The most popular reason, which impacted on future investment in e-commerce, was the company employees' lack of expertise (15.39 %). Not too far behind, was the fear of using e-commerce (13.08 per cent, n= 17); this was the second most popular factor impacting on e-commerce expansion in the firm. Due to the limitation of financial resources, in SMEs, and the high cost of investing in IT,

the lack of support and motivation, from top management, was the third highest ranked factor (n= 14, 10.77 per cent). On the other hand, the respondents did not mention the unavailable internal resources for e-commerce and e-commerce, unrelated to the company activity; this might reflect the connection between SMEs' activities and e-commerce practice.

#### **6.4.11 Problems experienced by SMEs in International Markets.**

This section investigates the difficulties, faced by Egyptian SMEs, when they went international. Trader were asked to indicate problems which they had experienced once trade had commenced and which, then, might affect future export and import behaviours (Table 6.24)

**Table 6.24: Trade Difficulties.**

<b>Difficulties</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Rank</b>
Difficulty of matching competitors prices	77	59.23	<b>1</b>
Difficulty of obtaining enough information about foreign markets	64	49.23	<b>2</b>
Non-availability of adequate support for products	63	48.46	<b>3</b>
Difficulty in choosing a reliable distributor	56	43.08	<b>4</b>
Barriers and trade barriers (tariffs, regulations etc...)	45	34.62	<b>5</b>
Insufficient distribution channels	43	33.08	<b>6</b>
Unfair competition with foreign companies	35	26.92	<b>7</b>
Inadequate marketing information on international markets	30	23.08	<b>8</b>
Difficulty in communicating with international companies	22	16.92	<b>9</b>
Inadequate support services for exports	20	15.38	<b>10</b>

**(Source:** Collected and calculated from the study field data)

Over three-quarters of SMEs (80 %) indicated that they came across problems once they entered international markets. It was possible that the remaining numbers had succeeded to limit their difficulties by successfully using business contacts and suppliers networks in

conjunction with the use of accurate information acquired from international trade points and electronic catalogues. The most popular encountered problem was matching competitors' prices; followed by obtaining enough information about foreign markets; and the non-availability of adequate support for products. The least problematical areas were in difficulty in communicating with international companies and inadequate support services for exports. Consequently, international market access was deemed not to be a major problem but matching competitors' prices was a problem.

#### 6.4.12 E-commerce limitations

This section highlights the factors which had a negative effect on the performance of e-commerce adopted by Egyptian SMEs. Traders were asked about the barriers and obstacles which they faced when they practiced e-commerce and which impacted on future importer and exporter behaviours (Table 6.25). All SMEs admitted that, from their e-commerce experiences, they faced some barriers.

**Table 6.25 E-commerce Barriers**

<b>Barriers</b>	<b>Mean</b>	<b>Rank</b>
- Local banks do not provide facilities for companies to encourage them to use e-commerce	4.0769	<b>1</b>
- Weak awareness programs about e-commerce and its importance.	4.0538	<b>2</b>
- Legislative and legal structures are not strong to control and regulate e-commerce.	3.9846	<b>3</b>
- Information and communication technology at a level that does not encourage companies to adopt e-commerce	3.7769	<b>4</b>
- The lack of racial confidentiality and security through the use of e-commerce	3.7769	<b>5</b>
- Lack of trust between trading parties.	3.7231	<b>6</b>
- Slow completion of commercial transactions because of not using of electronic means in all e-commerce phases.	3.6923	<b>7</b>
- Many commercial transactions still require the traditional method of trading.	3.6385	<b>8</b>

- The company employees are not well trained to deal with e-commerce	3.6000	<b>9</b>
- Information technology tools at the price level that does not help companies to modernize the use of e-commerce	3.5846	<b>10</b>
- The government does not have plans and distinctive strategies to deal with e-commerce.	3.5692	<b>11</b>
- Language differences affect the decisions of the company in dealing with some companies abroad	3.3077	<b>12</b>
- E-commerce need some protocols with special conditions, which are difficult for companies to abide with.	3.4077	<b>13</b>

(**Source:** Collected and calculated from the study field data)

The most popular barrier was lack of support and facilities from local banks (mean= 4.077), followed by weak awareness of programmes about e-commerce and its importance (mean= 4.053). Un-clear and unstructured legislative and legal frameworks to control and regulate e-commerce (mean= 3.98) were, also, one of the most popular impediments which impeded SMEs' effective e-commerce. The least affected barriers were special protocols required in using e-commerce (mean= 3.41); government future plans to encourage e-commerce practice (mean= 3.57); and difference in language (mean= 3.31). Therefore, e-commerce's performance depended not only on individual decisions and trends but, also, on the availability of an appropriate environment which encouraged its use and which minimised its obstacles.

## **6.5 Multivariate Inferential Statistical Testing of Results**

Following the earlier descriptive analysis of Egyptian SMEs companies, this section analyse the relationships and differences between factors at owner/manager level (Decision maker); firm level; and e-commerce environment characteristics, and how these impacted on SME

behaviours and the adoption of e-commerce adoption. In order to show the results, the researcher adopted the following variable classification:

### **The study variables:**

#### **A- Independent variables:**

##### **I- Variables related to decision maker characteristics:**

- Age.
- Gender.
- Education Level.
- Position in the company.
- Decision maker acceptance of e-commerce
- Decision maker's support
- Decision maker's attitude towards change

##### **II- Variables related to organisational characteristics:**

- The Company's Activity.
- Number of Employees.
- The Company's capital volume.
- The Company's age.
- Employees IT knowledge
- The firm's marketing capabilities

##### **III- Variables related e-commerce Characteristics:**

- The effect of geographic distance.
- Factors that have an impact on the firm's e-commerce decisions.
- E-commerce research.

- Future strategies of e-commerce practice.
- The impact of relationship with other parties.
- The impact of electronic commerce on the performance of the company's tasks.

#### **IV- E-readiness**

#### **V- Government Support**

#### **VI- E-commerce Barriers**

**B- Dependent variables (e-commerce success) were explained by e-commerce benefits: (question 14) relates to the questioner and methodology chapter. As discussed in section 3.9.**

### **6.5.1 Formulating hypotheses of the study**

In order to investigate the relationship between variables, the researcher studied and identified various aspects from previous studies related to the adoption; practice; diffusion; and performance of e-commerce in SMEs. These were in addition to addressing the research questions and the main study objectives which were constructs of the following tested hypotheses (Table 6.26).

**Table 6.26 Summary of Hypotheses of the Research**

	<b>Individual characteristics</b>	<b>Expected Effect</b>
<b>H1</b>	The older the decision maker, the more negatively disposed to the adoption of e-commerce.	-

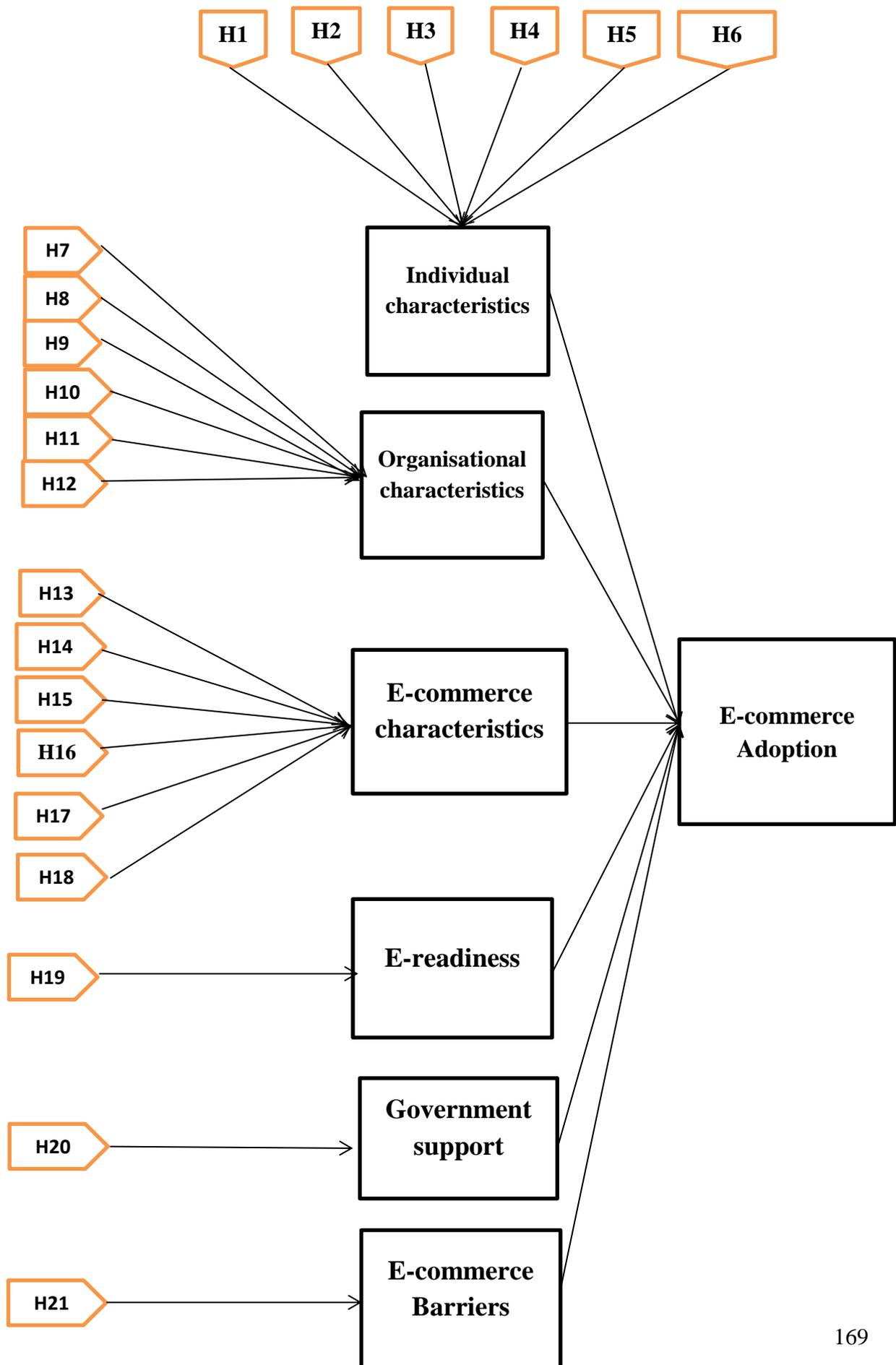
<b>H2</b>	The decision maker's gender has an impact on the adoption of e-commerce.	+
<b>H3</b>	The higher education level of decision maker, the greater possibility of the adoption of e-commerce.	+
<b>H4</b>	The higher position of the decision maker in the firm, the increased possibility of the adoption of e-commerce.	+
<b>H5</b>	Proactive decision makers are more likely to adopt e-commerce than reactive ones.	+
<b>H6</b>	Having positive attitude towards change results in more positive disposition towards the adoption of e-commerce.	+
<b>Organisational characteristics</b>		
<b>H7</b>	The types of products/services determine the level of adoption of e-commerce.	+
<b>H8</b>	The larger the firm, the more likely the adoption of e-commerce.	+
<b>H9</b>	The more assets in the firm, the more likely the adoption of e-commerce.	+
<b>H10</b>	The more experience in the market, the more likely the adoption of e-commerce.	+
<b>H11</b>	The higher IT knowledge of employees, the increased possibility of e-commerce adoption.	+
<b>H12</b>	Increased use of internet marketing is associated with higher levels of e-commerce adoption.	+
<b>E-commerce Characteristics</b>		
<b>H13</b>	Increasing geographical distance within a B2B relationship relates to a higher chance of e-commerce adoption.	-
<b>H14</b>	The more availability of communication tools the higher the possibility of e-commerce adoption.	
<b>H15</b>	Increasing levels of research by the company are associated with the higher levels of e-commerce adoption.	+
<b>H16</b>	The more the company engages in future strategies, the more likely it is to adopt e-commerce.	+
<b>H17</b>	Higher usage of B2B relationships result in increased levels of e-commerce adoption.	+
<b>H18</b>	The more tasks involved, the more likely the firm is to adopt e-commerce.	+
<b>E-readiness</b>		
<b>H19</b>	The more e-ready the firm is the more it is likely to adopt e-commerce.	+

	<b>Government Support</b>	
<b>H20</b>	Increasing levels of government support result in increased levels of e-commerce adoption.	+
	<b>E-commerce Barriers</b>	
<b>H21</b>	The more barriers the more negative the impact on the adoption of e-commerce.	-

### 6.5.2 Proposed Conceptual Model

This research provides an empirical contribution by studying the trade sector as a branch of the service industry. The researcher investigated, in the environment of a developing country (Egypt), the comparative factors which determined SMEs' adoption of e-commerce. In order to achieve that, the researcher combined existing theories in order to develop a conceptual framework for the factors which contributed to the trade sector's adoption of e-commerce. Besides the resource-based view of the firm (Porter, 1980, p.75) and Roger's model of adopting innovation rate (Rogers, 2003, p.170); Technology–Organization–Environment (TOE) Model; and Technology Acceptance Model (TAM) were used to deliver valuable information about the firm-specific factors which were believed to influence the adoption of innovation. The developed model (figure 5.4) was constructed purely on existing research and it integrated different theoretical viewpoints. In addition, the researcher tested this framework empirically by using quantitative data from export and import small and medium Egyptian enterprises

**Figure 6.3: Proposed Conceptual model**



### 6.5.3 Hypotheses Results

This section highlights correlations and differences between dependent and independent variables about the firm's adoption of e-commerce. Pearson's Correlation Coefficient was used to investigate the relationship between CEO/managers (Decision maker) age; their support; and attitude toward change with adoption of e-commerce. T-tests were used to investigate differences between CEO/managers' gender on the adoption of e-commerce. ANOVA was used to investigate differences between CEO/manager education level and their position, in the firm, on the adoption of e-commerce. Multivariate Inferential Statistical Tests were used to investigate the independence of variables (if examined value  $X^2 > \text{critical value } X^2_{\alpha}$ , reject  $H_0$ ;  $H_0$ : there was no correlation between the variables;  $H_a$ : there was an association between the variables; significance level = 0.01 & 0.05).

***H1: The older the decision maker, the more negatively disposed to the adoption of e-commerce.***

There did not appear to be any significant correlation, in the firm, between the the decision maker's age and the adoption of e-commerce (Table 6.27). However, in Bantel's (1992) study about top management teams, he concluded that firms, most likely to undergo changes in corporate strategy, had a younger age top management team. Consequently, we accepted the  $H_0$ : there was no correlation between the decision maker's age and the adoption of e-commerce and refuted  $H_a$ : there was an association between the decision maker's age and the adoption of e-commerce

**Table 6.27: CEO/manger’s age and adoption of e-commerce**

Variable	R
Decision maker age	-.066

\*\* Significant at level 0.01

(**Source:** Collected and calculated from the study field data)

**H2 *The decision maker’s gender has an impact on the adoption of e-commerce.***

The T-test was used to look at differences between SMEs in terms of the decision maker’s gender on the adoption of e-commerce. As shown in Table 6.28, there appeared to be a significant difference between variables (sig=.041, level = 0.05).

**Table 6.28: Decision maker gender and adoption of e-commerce**

Variable	T	Sig
Decision maker gender	.188	.041*

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

Adopting e-commerce as a new innovation of exchanging products/services was of greater importance to males compared to females (mean= 3.72). This compared favourably with Byrnes et al (1999) who noted that men were more willing to accept new functions than women. Consequently, we refuted the Ho: there was no significant difference between a decision maker’s gender and the adoption of e-commerce; and accepted Ha: there was a significant difference between a decision maker’s gender and the adoption of e-commerce.

**H3: *The higher education level of decision maker, the greater possibility of the adoption of e-commerce.***

The ANOVA test was used to investigate the differences between SME decision maker education level (college/higher educational qualification - university degree - postgraduate qualification) on the adoption of e-commerce (sig= .001, level = 0.01). Table 6.29 shows that there appeared to be a significant difference between the variables.

**Table 6.29: CEOs/managers education level and adoption of e-commerce**

Variable	F	Sig
Decision maker education level	2.304	.001**

\*\* Significant at level 0.01

(Source: Collected and calculated from the study field data)

This showed that higher education resulted in more understanding of e-commerce (postgraduate qualification, mean =3.30). This was consistent with Riddell and Song (2012) who considered that highly educated individuals tended to adopt new technologies faster than those with less education.

Therefore, we refuted the Ho: there was no significant difference between education level and adoption of e-commerce; and we accepted Ha: there was a significant difference between education level and adoption of e-commerce.

**H4: *The higher position of the decision maker in the firm, the increased possibility of the adoption of e-commerce.***

There appeared to be significant differences, between SMEs, in terms of the decision maker position (CEO, Vice CEO and senior management), in the firm, upon the adoption of e-commerce (sig= 0.000, level = 0.01) as shown in (Table 6.30).

**Table 6.30: CEOs/ managers position and the adoption of e-commerce**

Variable	F	Sig
<b>Decision maker position</b>	7.925	.000**

\*\* Significant at level 0.01

(Source: Collected and calculated from the study field data)

These compared with Premkumar (2007) who stated that the firm’s top management were most likely to be responsible for accepting and adopting IT.

Consequently, we refuted the Ho: there was no significant difference between the decision maker’s position and the adoption of e-commerce; and accepted Ha: there was a significant difference between the decision maker’s position and the adoption of e-commerce.

**H5 *Proactive decision makers are more likely to adopt e-commerce than reactive ones.***

There appeared to be a positive association between top management support and the adoption of e-commerce (R= .178, significance level = 0.05) as shown in (Table 6.31).

**Table 6.31: Top management support**

<b>Variable</b>	<b>R</b>
<b>Top management support</b>	<b>.178*</b>

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

This was in line with Premkumar and Roberts (1999) who noted that top management support was important in providing the required resources and creating a supportive climate for the adoption of new technology. Consequently, we refuted the Ho: there was no significant correlation between top management support and e-commerce adoption; and we accepted Ha: there was a significant correlation between top management support and adoption of e-commerce.

### **The strength of the relationship in the regression model:**

By examining the relationship between top management support (independent variable) and adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 31.351 + .223x$$
$$(17.37)** \quad (1.46)**$$
$$R^2 = .016 \quad (F 2.132)**$$

#### **Evaluating the model**

##### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.223; this meant that, when the top management support increased, the chance of adopting e-commerce increased by 0.223 unit at (calculated T = 1.46, significant at 0.01).

## b) Statistical evaluation

The value of the coefficient of determination ( $R^2 = 0.016$ ); this meant that 1.6% of the adoption of e-commerce was influenced by top management support and the rest depended on other factors. The linear relationship was significant ( $f = 2.132$ ,  $\text{sig} = 0.01$ ); this referred to the statistical significance of the estimated relationship; this meant that top management support had a statistically significant effect on the adoption of e-commerce.

## c) Econometric evaluation

The value of Durbin-Waston (Wooldridge, 2009, p.415) statistic ( $D = 1.221$ ); this meant there was statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

### *H6 Having positive attitude towards change results in more positive disposition towards the adoption of e-commerce.*

As shown in Table 6.32, there appeared to be a positive correlation between top management attitude towards change and the adoption of e-commerce ( $R = .188$ , significance level = 0.05).

**Table 6.32: Attitude towards change**

Variable	R
Top management attitude towards change	.188*

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

This was in line with Abukhzam and Lee (2010) who noted that, if they were dynamic and more involved in understanding IT, top management were more likely to be positive towards new innovations. Consequently, we refuted the  $H_0$ : there was no significant

correlation between top management attitude towards change and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between top management attitude towards change and the adoption of e-commerce.

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between top management attitude towards change (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 30.719 + .171x$$

(15.477)\*\*    (1.003)\*\*  
R<sup>2</sup> = .003    (F = 1.007)

### **Evaluating the model**

#### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.171; this meant that, when the top management tended to accept change and there was an increase of one unit, the chance of adopting e-commerce increased by 0.171 unit and calculated T was 1.003, significant at 0.01.

#### **b) Statistical evaluation**

The value of the coefficient of determination ( $R^2 = 0.003$ ); this meant that 0.3% of the adoption of e-commerce was influenced by top management attitudes and the rest referred to other factors. The linear relationship was significant ( $f = 1.007$ ); this referred to the non-statistical significance of the estimated relationship. This meant that top

management attitude towards change on the adoption of e-commerce had no statistically significant effect

**c) Econometric evaluation**

The value of Durbin-Waston statistic (D= 1.101); this meant that there was statistical evidence that the error terms were auto-correlated positively since, as calculated, D was lower than the minimum value of tabular D.

**H7 *The types of products/services determine the level of adoption of e-commerce.***

There appeared to be significant differences between SMEs in terms of activity type (Import - export – Import& export) and the adoption of e-commerce (sig= .024, level = 0.05). As shown in Table 6.33, an ANOVA test was used to investigate this difference.

**Table 6.33: Company activity and adoption of e-commerce**

<b>E-commerce performance</b>	<b>F</b>	<b>Sig</b>
<b>Company activity</b>	<b>3.855</b>	<b>0.024*</b>

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

This was consistent with Pohlen (1996) who noted that the cost of a firm’s activity was related to accepting a new innovation

Consequently, we refuted the Ho: there was no significant difference between firm activity and adoption of e-commerce; and accepted Ha: there was a significant difference between firm activity and the adoption of e-commerce.

**H8 *The larger the firm, the more likely the adoption of e-commerce.***

As shown in Table 6.33, there appeared to be a significantly positive relationship between the firm size and the adoption of e-commerce (R= .173, significance level = 0.05) as shown in (table 6.34).

**Table 6.34: The employment level and the adoption of e-commerce**

Variables	R
Firm size	.173*

\* Significant at level 5%

(Source: Collected and calculated from the study field data)

This was consistent with Zhu and Kraemer’s (2005) finding about the relationship between firm size and the adoption of e-commerce.

Consequently, we refuted the Ho: there was no significant correlation between the firm size and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between the firm size and the adoption of e-commerce.

**The Strength of the Relationship in the Regression Model**

By examining the relationship between the firm size (number of employees) (independent variable) and adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y=29.748 + 0.02 x$$

$$(52.010)** \quad (1.990)*$$

$$R^2=0.03 \quad F=3.958 *$$

### Evaluating the model

#### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.02; this meant that, when the firm size increased by one unit, the chance of adopting e-commerce increased by 0.02 unit and (T=1.990, sig = 0.05). This was consistent with Zhu and Kraemer's (2005) findings.

#### **b) Statistical evaluation**

The value of the coefficient of determination ( $R^2 = 0.03$ ); this meant that the firm size contributed by 3.0% to the influence of the adoption of e-commerce and the rest referred to other factors. The linear relationship was significant ( $f = 3.958$ , sig = 5%); this referred to the statistically significant effect of the firm size on the adoption of e-commerce.

#### **c) Econometric evaluation**

The value of Durbin-Waston statistic ( $D = 1.47$ ); this meant that there was statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

### ***H9 The more assets in the firm, the more likely the adoption of e-commerce.***

As shown in Table 6.35, there appeared to be a significant positive association between the firm capital/ assets volume and the adoption of e-commerce ( $R = .161$ , significant level = 0.05).

**Table 6.35: Firm capital/ assets volume and the adoption of e-commerce**

<b>Variables</b>	<b>R</b>
<b>firm capital/ assets volume</b>	<b>0.161*</b>

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

This agreed with Lacovou et al.'s (1995) finding that small firms, with more available financial resources, were better equipped to employ integrated EDI systems.

Consequently, we refuted the Ho: there was no significant correlation between the firm capital size and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between the firm capital size and e-commerce and the adoption of e-commerce.

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between the firm capital/ assets volume (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = -4.568 + 0.0000003879x$$

$$(4.444)** \quad (2.045)*$$

$$R^2 = 0.032 \quad F = 4.18*$$

#### **Evaluating the model**

##### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.0000003879; this meant that, when the financial resource increased by one unit, the likelihood of the adoption of e-commerce increased by 0.0000003879 unit and ( T = 2.045, sig = 0.05). This was consistent with Lacovou et.al.'s (1995) findings.

##### **b) Statistical evaluation:**

The value of the coefficient of determination ( $R^2 = 0.032$ ); this means that the size of the company's capital contributed by 3.2% in influencing the likelihood of the adoption of e-commerce adoption and the rest referred to other factors. The linear relationship was significant ( $f = 4.18$ ,  $sig = 5\%$ ); this referred to the statistical significance of the estimated relationship. This meant that the company's capital had a statistically significant effect on the adoption of e-commerce.

**c) Econometric evaluation**

The value of Durbin-Waston statistic ( $D = 1.421$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

**H10** *The more experience in the market, the more likely the adoption of e-commerce.*

There did not appear to be significant correlation between the SME's age and the adoption of e-commerce (table 6.36). On the contrary, Goode & Stevens, 2000 found that, rather than older ones, younger organizations were more likely to adopt IT since they believed that this was due to the more flexible structure of younger organizations.

Consequently, we accepted the  $H_0$ : there was no correlation between the firm age and the adoption of e-commerce; and we refuted  $H_a$ : there was an association between the firm age and the adoption of e-commerce.

**Table 6.36: The company age and adoption of e-commerce**

Variables	R
company age	.144

(Source: Collected and calculated from the study field data)

**H11 *The higher IT knowledge of employees, the increased possibility of e-commerce adoption.***

As shown in Table 6.37, there appeared to be a significantly positive association between employees' IT knowledge and the adoption of e-commerce adoption (R= .441, significant level = 0.01).

**Table 6.37: Employees' IT knowledge and adoption of e-commerce**

<b>Variables</b>	<b>R</b>
<b>Employees' IT knowledge</b>	<b>.441**</b>

\*\* Significant at level 0.01

(Source: Collected and calculated from the study field data)

This was consistent with Premkumar & Roberts' 1999 finding about the relationship between IT knowledge within the organization and the adoption of innovation.

Consequently, we refuted the Ho: there was no significant correlation between employees' IT knowledge and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between employees' IT knowledge and the adoption of e-commerce.

**The Strength of the Relationship in the Regression Model**

By examining the relationship between the employees' IT knowledge (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 27.898 + .077 x$$

$$(14.954)** \quad (2.46)**$$

$$R^2 = .002 \quad (F = 3.12)*$$

## **Evaluating the model**

### **a) Economic evaluation:**

The regression coefficient was positive with a value of 0.77; this meant that, when the employees' IT knowledge increased by one unit, the likelihood of the adoption of e-commerce increased by 0.077 unit and ( $T = 2.46$ ,  $\text{sig} = 0.01$ ). This was consistent with Premkumar & Roberts' (1999) finding.

### **b) Statistical evaluation**

The value of the coefficient of determination ( $R^2 = .002$ ); this meant that the employees' IT knowledge contributed by 0.2% in influencing the likelihood of the adoption of e-commerce and the rest referred to other factors. The linear relationship was significant ( $f = 3.12$ ,  $\text{sig} = 5\%$ ); this referred to the statistical significance of the estimated relationship. This meant that the employees' IT knowledge had a statistically significant effect on the adoption of e-commerce.

### **c) Econometric evaluation**

The value of Durbin-Waston statistic ( $D = 1.331$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

## ***H12 Increased use of internet marketing is associated with higher levels of e-commerce adoption.***

Table 6.38 shows that there appeared to be significant positive relationship between the firm marketing capabilities and the adoption of e-commerce adoption ( $R = .313$ , significant level = 0.01).

**Table 6.38: Marketing capability and adoption of e-commerce**

<b>Variables</b>	<b>R</b>
<b>Marketing capability</b>	<b>.313**</b>

\*\* Significant at level 0.01

(**Source:** Collected and calculated from the study field data)

This agreed with Poon and McPherson's (2005) finding that there was a positive relationship between marketing capabilities and the adoption of innovation.

Consequently, we refute the Ho: there was no significant correlation between the firm's marketing capabilities and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between the firm's marketing capabilities and e-commerce and the adoption of e-commerce.

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between the firm's marketing capabilities (independent variable) and the adoption of e-commerce adoption (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 28.471 + .025x$$

$$(14.988)** \quad (3.146)**$$

$$R^2 = .002 \quad (F = 3.021)**$$

#### **Evaluating the model**

##### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.025; this meant that, when the firm's marketing capabilities increased by one unit, the likelihood of the adoption of e-commerce increased by 0.025 unit and ( $T = 3.146$ ,  $\text{sig} = 0.01$ ). This was consistent with Poon and McPherson's (2005) finding.

**b) Statistical evaluation**

The value of the coefficient of determination ( $R^2 = .002$ ); this meant that the firm's marketing capabilities contributed by 0.2% in influencing the likelihood of the adoption of e-commerce adoption and the rest referred to other factors. The linear relationship was significant ( $f = 3.02$ ,  $\text{sig} = 1\%$ ); this referred to the statistical significance of the estimated relationship. This meant that the firm's marketing capabilities had a statistically significant effect of on the adoption of e-commerce.

**c) Econometric evaluation**

The value of Durbin-Waston statistic ( $D = 1.151$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

***H13 Increasing geographical distance within a B2B relationship relates to a higher chance of e-commerce adoption.***

Table 6.39 shows that there appeared to be no significant differences between geographical distance and the adoption of e-commerce ( $\text{sig} = .184$ ). Consequently, we accepted the  $H_0$ : there was no significant difference between geographical distance and the adoption of e-commerce and refuted  $H_a$ : there was a significant difference between geographical distance and the adoption of e-commerce.

**Table 6.39: Geographic distance and the adoption of e-commerce**

Variables	F	Sig
Geographic distance	1.581	.184

(Source: Collected and calculated from the study field data)

**H14** *The more availability of communication tools the higher the possibility of e-commerce adoption.*

Table 6.40 shows that there appeared to be significant positive relationship between communication tools and the adoption of e-commerce (R=.341, significant level = 0.01).

**Table 6.40: Factors affecting the company decisions and the adoption of e-commerce**

Variables	R
Factors affecting e-commerce practice	.341**

\*\* Significant at level 0.01

(Source: Collected and calculated from the study field data)

Consequently, we refuted the Ho: there was no significant correlation between the factors affecting the firm’s decisions and the adoption of e-commerce; and accepted Ha: there was a significant correlation between the factors affecting the firm decisions and the adoption of e-commerce.

## **The Strength of the Relationship in the Regression Model**

By examining the relationship between factors affecting the company decisions (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y=19.742+ 0.293 x$$

$$(8.940)** \quad (4.106)**$$

$$R^2=0.116 \quad F=16.859**$$

### **Evaluating the model**

#### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.293; this meant that, when the availability of communication tools increased by one unit, the likelihood of the adoption of e-commerce increased by 0.293unit, (T = 4.106, sig = 0.01). This seemed to relate to Glushko et al. (1999) who stated that attributes of communication tools including EDI and internet had an important role in the adoption of e-commerce.

#### **b) Statistical evaluation**

The value of the coefficient of determination ( $R^2 = 0.116$ ); this meant that e-commerce practice factors contributed by 11.6 % in influencing the adoption of e-commerce and the rest referred to other factors. The linear relationship was significant ( $f = 16.859$ , sig = 1%); this referred to the statistical significance of the estimated relationship. This meant that the characteristics and availability of communication tools had a statistically significant effect of on plans to adopt e-commerce the adoption plans.

#### **c) Econometric evaluation**

The value of Durbin-Waston statistic ( $D= 1.581$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated, D was lower than the minimum value of tabular D.

**H15 Increasing levels of research by the company are associated with the higher levels of e-commerce adoption.**

Table 6.41 shows that there appeared to be a significant difference, between SMEs, in terms of the importance of doing researches on e-commerce and its adoption (sig= 0.000, level= 1%).

**Table 6.41: e-commerce researches and the adoption of e-commerce**

<b>Variables</b>	<b>F</b>	<b>Sig</b>
<b>E-commerce researches</b>	<b>9.459</b>	<b>.000**</b>

\*\* Significant at level 0.01

(Source: Collected and calculated from the study field data)

Consequently, we refuted the Ho: there was no significant difference between conducting e-commerce researches and the adoption of e-commerce; and we accepted Ha: there was a significant difference between conducting e-commerce researches and the adoption of e-commerce.

**H16 The more the company engages in future strategies, the more likely it is to adopt e-commerce.**

T-test was used to investigate the differences between SMEs in terms of increasing the investment in using e-commerce on the adoption of e-commerce. Table 6.42 shows that

there appeared to be a significant difference between variables (mean= 29.18, sig=0.27, level = 0.05).

**Table 6.42: e-commerce future strategy and the e-commerce practice.**

Variable	T	Sig
e-commerce future strategy	2.244	.027*

\* Significant at level 0.05

(Source: Collected and calculated from the study field data)

Consequently, we refuted the Ho: there was no significant difference between the future investment strategies and the adoption of e-commerce and accepted Ha: there was a significant difference between the future investment strategies and the adoption of e-commerce.

***H17 Higher usage of B2B relationships result in increased levels of e-commerce adoption.***

Table 6.43 shows that there appeared to be a significantly positive relationship between relationship with other parties and the adoption of e-commerce (R=.221, significant level = 0.05). This was consistent with Benbasat and Dexter (1995) who noted that other parties were expected to be one of the most critical factors for the adoption of EDI.

**Table 6.43: Relationship with Other Parties and the adoption of e-commerce**

<b>Variables</b>	<b>R</b>
<b>Relationship with Other Parties</b>	<b>.221*</b>

\* Significant at level 0.05

(**Source:** Collected and calculated from the study field data)

Consequently, we refuted the Ho: there was no significant difference between the relationship with Other Parties and the adoption of e-commerce adoption; and accepted Ha: there was a significant difference between the relationship with Other Parties and the adoption of e-commerce.

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between relationship with Other Parties (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 24.961 + .147x$$

$$(10.662)** \quad (1.628)**$$

$$R^2 = .02 \quad F = 2.651$$

### **Evaluating the model**

#### **a) Economic evaluation**

The regression coefficient was positive with a value of 0.147; this meant that, when the strength of the relationship with other parties increased by one unit, the likelihood of the adoption of e-commerce increased by 0.147unit, (T = 1.63, sig = 0.01). This was consistent with Benbasat and Dexter's (1995) finding.

### b) Statistical evaluation

The value of the coefficient of determination ( $R^2 = 0.2$ ); this meant that the relationship with other parties contributed by 2 % in influencing the adoption of e-commerce and the rest referred to other factors. The linear relationship was insignificant ( $f = 2.65$ ); this referred to the statistical non-significance of the estimated relationship. This meant that e-commerce practice factors had no statistically significant effect on the adoption plans.

### c) Econometric evaluation

The value of Durbin-Waston statistic ( $D = 1.142$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

## **H18** *The more tasks involved, the more likely the firm is to adopt e-commerce.*

Table 6.44 shows that there appeared to be a significantly positive relationship between the performance of these tasks and the adoption of e-commerce ( $R = .262$ , significant level = 0.01).

**Table 6.44: the company tasks and the e-commerce performance.**

<b>Variables</b>	<b>R</b>
<b>The impact of the company tasks</b>	<b>.262**</b>

\*\* Significant at level 0.05

(Source: Collected and calculated from the study field data)

Consequently, we refuted the Ho: there was no difference between the performance of the firm's tasks and the adoption of e-commerce; and we accepted Ha: there was a significant correlation between the performance of the firm's tasks and the adoption of e-commerce

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between tasks performance (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 22.434 + .208x$$

$$(10.844)** \quad (3.077)**$$

$$R^2 = .069 \quad F = 9.466**$$

### **Evaluating the model**

#### **Economic evaluation**

The regression coefficient was positive with a value of 0.208; this meant that, when the tasks' performance increased by one unit, the likelihood of the adoption of e-commerce adoption increased by 0.208unit, ( $T = 3.077$ ,  $\text{sig} = 0.01$ ). This was consistent with Benbasat and Dexter's (1995) finding.

#### **Statistical evaluation**

The value of the coefficient of determination ( $R^2 = 0.069$ ); this meant that the tasks' performance contributed by 6.9 % in influencing the adoption of e-commerce by and the rest referred to other factors. The linear relationship was insignificant ( $f = 9.466$ ); this referred to the statistical significance of the estimated relationship. This meant that the firm tasks' performance had a statistically significant effect of on the e-commerce adoption strategy.

## Econometric evaluation

The value of Durbin-Waston statistic ( $D= 1.002$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

### **H19** *The more e-ready the firm is the more it is likely to adopt e-commerce.*

Table 6.45 shows that there appeared to be a significantly positive association between technology readiness and the adoption of e-commerce ( $R= .350$ , significant level = 0.01).

**Table 6.45: E-readiness and adoption of e-commerce**

Variable	R
E-readiness	<b>.350 **</b>

\*\* Significant at level 0.01

(**Source:** Collected and calculated from the study field data)

This was consistent with Liljander et al.'s view (2006) about the relationship between e-readiness and the adoption of innovation.

Consequently, we refuted the  $H_0$ : there was no significant correlation between e-readiness and the adoption of e-commerce; and we accepted  $H_a$ : there was a significant correlation between e-readiness and the adoption of e-commerce.

## The Strength of the Relationship in the Regression Model

By examining the relationship between the e-readiness (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 2.8 + 1.54 X$$

$$(.197) \quad (4.232)**$$

$$R^2 = .123 \quad (F = 17.91) **$$

### Evaluating the model

#### a) Economic evaluation:

The regression coefficient was positive with a value of 1.54; this meant that, when the e-readiness increased by one unit, the likelihood of the adoption of e-commerce increased by 1.54 unit and ( $T = 4.232$ ,  $\text{sig} = 0.01$ ). This was consistent with Liljander et. al.'s, (2006) finding.

#### b) Statistical evaluation

The value of the coefficient of determination ( $R^2 = .123$ ); this meant that the e-readiness contributed 1.23% in influencing the likelihood of the adoption of e-commerce adoption by and the rest referred to other factors. The linear relationship was significant ( $f = 17.91$ ,  $\text{sig} = 1\%$ ); this referred to the statistical significance of the estimated relationship. This meant that the e-readiness had a statistically significant effect on the adoption of e-commerce.

#### c) Econometric evaluation

The value of Durbin-Waston statistic ( $D = 1.51$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

## **H20 Increasing levels of government support result in increased levels of e-commerce adoption.**

Table 6.46 shows that there appeared to be a significantly positive association between government support and the adoption of e-commerce ( $R = .295$ , significant level = 0.01).

**Table 6.46: Government Support and adoption of e-commerce**

<b>Variable</b>	<b>R</b>
<b>Government Support</b>	<b>.295 **</b>

\*\* Significant at level 0.01

(**Source:** Collected and calculated from the study field data)

This was consistent with Simpson and Docherty's view (2004) concerning the relationship between the government support and the adoption of e-commerce.

Consequently, we refuted the  $H_0$ : there was no significant correlation between government support and the adoption of e-commerce; and we accepted  $H_a$ : there was a significant correlation between government support and the adoption of e-commerce.

## **The Strength of the Relationship in the Regression Model**

By examining the relationship between the government support (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y = 1.6 + .96X$$

$$(2.9)** \quad (3.49)**$$

$$R^2 = .087 \quad f = 12.228) **$$

## **Evaluating the model**

### **Economic evaluation:**

The regression coefficient was positive with a value of 0.96; this meant that, when the e-readiness increased by one unit, the likelihood of the adoption of e-commerce increased by 0.96 unit and ( $T = 3.49$ ,  $\text{sig} = 0.01$ ). This was consistent with Simpson and Docherty's (2004) finding.

### **Statistical evaluation**

The value of the coefficient of determination ( $R^2 = .087$ ); this meant that the government support contributed 8.7% in influencing the adoption of e-commerce and the rest referred to other factors. The linear relationship was significant ( $f = 12.228$ ,  $\text{sig} = 1\%$ ); this referred to the statistical significance of the estimated relationship. This meant that the government support had a statistically significant effect on the adoption of e-commerce.

### **d) Econometric evaluation**

The value of Durbin-Waston statistic ( $D = 1.01$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

## ***H21 The more barriers the more negative the impact on the adoption of e-commerce.***

Table 6.47 shows that there appeared to be a significantly negative relationship between e-commerce barriers and the adoption of e-commerce ( $R = -.354$ , significant level = 0.01).

**Table 6.47: e-commerce barriers and the adoption of e-commerce**

<b>Variables</b>	<b>R</b>
<b>E-commerce barriers</b>	<b>-.354**</b>

\*\* Significant at level 0.01

(**Source:** Collected and calculated from the study field data)

This was consistent with Wymer and Regan's (2005) finding of the relationship between the barriers and adoption of e-commerce.

Consequently, we refuted the Ho: there was no significant correlation between e-commerce barriers and the adoption of e-commerce ; and we accepted Ha: there was a significant correlation between e-commerce barriers and the adoption of e-commerce.

### **The Strength of the Relationship in the Regression Model**

By examining the relationship between e-commerce barriers (independent variable) and the adoption of e-commerce (dependent variable) and by using linear regression, the equation was as follows:

$$Y=25.162 - 0.074 x$$

$$(8.8)** \quad (-1.259)*$$

$$R^2=0.012 \quad F=1.856*$$

#### **Evaluating the model**

##### **a) Economic evaluation:**

The regression coefficient was negative with a value of -0.074; this meant that, when e-commerce barriers increased by one unit, the chance of adopting e-commerce reduced by- 0.074 unit, (T = -1.259, sig = 0.05). This was consistent with Wymer and Regan's (2005) finding.

## b) Statistical evaluation

The value of the coefficient of determination ( $R^2 = 0.012$ ); this meant that e-commerce barriers contributed 1.2 % in influencing the adoption of e-commerce by and the rest referred to other factors. The linear relationship was significant ( $f = 1.856$ ,  $\text{sig} = 1\%$ ); this referred to the statistical significance of the estimated relationship. This meant that e-commerce barriers had a statistically significant effect of on the adoption of e-commerce.

## c) Econometric evaluation

The value of Durbin-Waston statistic ( $D = 1.457$ ); this referred to the statistical evidence that the error terms were auto-correlated positively since, as calculated,  $D$  was lower than the minimum value of tabular  $D$ .

**Table 6.48 Summary of hypotheses results**

	<b>Individual characteristics</b>	<b>Expected Effect</b>	<b>Actual effect</b>
<b>H1</b>	The older the decision maker, the more negatively disposed to the adoption of e-commerce.	-	N.S*
<b>H2</b>	The decision maker's gender has an impact on the adoption of e-commerce.	+	+
<b>H3</b>	The higher education level of decision maker, the greater possibility of the adoption of e-commerce.	+	+
<b>H4</b>	The higher position of the decision maker in the firm, the increased possibility of the adoption of e-commerce.	+	+
<b>H5</b>	Proactive decision makers are more likely to adopt e-commerce than reactive ones.	+	+
<b>H6</b>	Having positive attitude towards change results in more positive disposition towards the adoption of e-commerce.	+	+
	<b>Organisational characteristics</b>		
<b>H7</b>	The types of products/services determine the level of adoption of e-commerce.	+	+

<b>H8</b>	The larger the firm, the more likely the adoption of e-commerce.	+	+
<b>H9</b>	The more assets in the firm, the more likely the adoption of e-commerce.	+	+
<b>H10</b>	The more experience in the market, the more likely the adoption of e-commerce.	+	N.S
<b>H11</b>	The higher IT knowledge of employees, the increased possibility of e-commerce adoption.	+	+
<b>H12</b>	Increased use of internet marketing is associated with higher levels of e-commerce adoption.	+	+
<b>E-commerce Characteristics</b>			
<b>H13</b>	Increasing geographical distance within a B2B relationship relates to a higher chance of e-commerce adoption.	-	N.S
<b>H14</b>	The more availability of communication tools the higher the possibility of e-commerce adoption.	+	+
<b>H15</b>	Increasing levels of research by the company are associated with the higher levels of e-commerce adoption.	+	+
<b>H16</b>	The more the company engages in future strategies, the more likely it is to adopt e-commerce.	+	+
<b>H17</b>	Higher usage of B2B relationships result in increased levels of e-commerce adoption.	+	+
<b>H18</b>	The more tasks involved, the more likely the firm is to adopt e-commerce.	+	+
<b>E-readiness</b>			
<b>H19</b>	The more e-ready the firm is the more it is likely to adopt e-commerce.	+	+
<b>Government Support</b>			
<b>H20</b>	Increasing levels of government support result in increased levels of e-commerce adoption.	+	+
<b>E-commerce Barriers</b>			
<b>H21</b>	The more barriers the more negative the impact on the adoption of e-commerce.	-	-

\*N.S: Not significant

## **6.6 Summary**

This Chapter examined the similarities and emerging differences between this research's findings and the adoption of e-commerce literature. With certain consideration to the differences found in the owner/manager orientation during data analysis, several courses of approaches were discussed in order to explain the SMEs adoption of e-commerce. These results aimed to evaluate the hypotheses were developed in the previous chapter. This quantitative work designed to test the proposed model in this research, which includes six group factors namely, individual characteristics, organisational characteristics, innovation characteristics, E-readiness, government support and e-commerce Barriers. Various results were obtained of testing hypotheses as some of them have shown either positive or negative significant relation with the adoption of e-commerce, however the other haven't showed any relation with the adoption of e-commerce by SMEs. The next chapter will discuss these results in more details with the consisting of previous research.

**CHAPTER SEVEN**  
**DISCUSSION OF FINDINGS**

## **7.0 Introduction**

The purpose of this chapter is to present preliminary insights and to discuss the results which emerged from the data analysis. The approach, adopted in this chapter, was that the discussion restated the highlights as to whether the results were as anticipated or were unexpected. The discussion attempted to bring together these research results with previous studies' findings. Firstly, this chapter discusses the results obtained from interpreting the SME characteristics followed by a discussion of the factors associated with the adoption of e-commerce. These factors were such as individual factors; organisational characteristics; e-commerce characteristics; e-readiness; and government support. Then, there is discussed the impact, of the adoption of e-commerce, on firms, and, finally, there is a description of the advantages motivating SMEs to adopt e-commerce.

## **7.1 Analysis of the Approach**

The correlation and simple regression analysis techniques were the analysis tools used for the examination and interpretation of the hypotheses. In order to explain these techniques, it is essential to consider first the objective of this research. The purpose of this research was to investigate practically the contributing elements of small and medium Egyptian enterprises adopting e-commerce adoption by in their export and import sectors. It also aimed, also, to test the developed theoretical framework in order to recommend the generalisation of the results. As explained in the methodology chapter, different approaches were used in the questionnaire to achieve that outcome. The adoption of e-commerce was not a discrete phenomenon; it was not a mere dichotomy of did you use or did you not use e-commerce. It was more about the way and degree of adoption of e-commerce; nevertheless, it was difficult to measure. In the early stage of this research the study aimed to compare the situation between two degrees of adoption: simple; and sophisticated adoption of e-commerce by

SMEs. However, since all SMEs, which participated in this study, were basic adopters, the case of comparison did not applied in this approach.

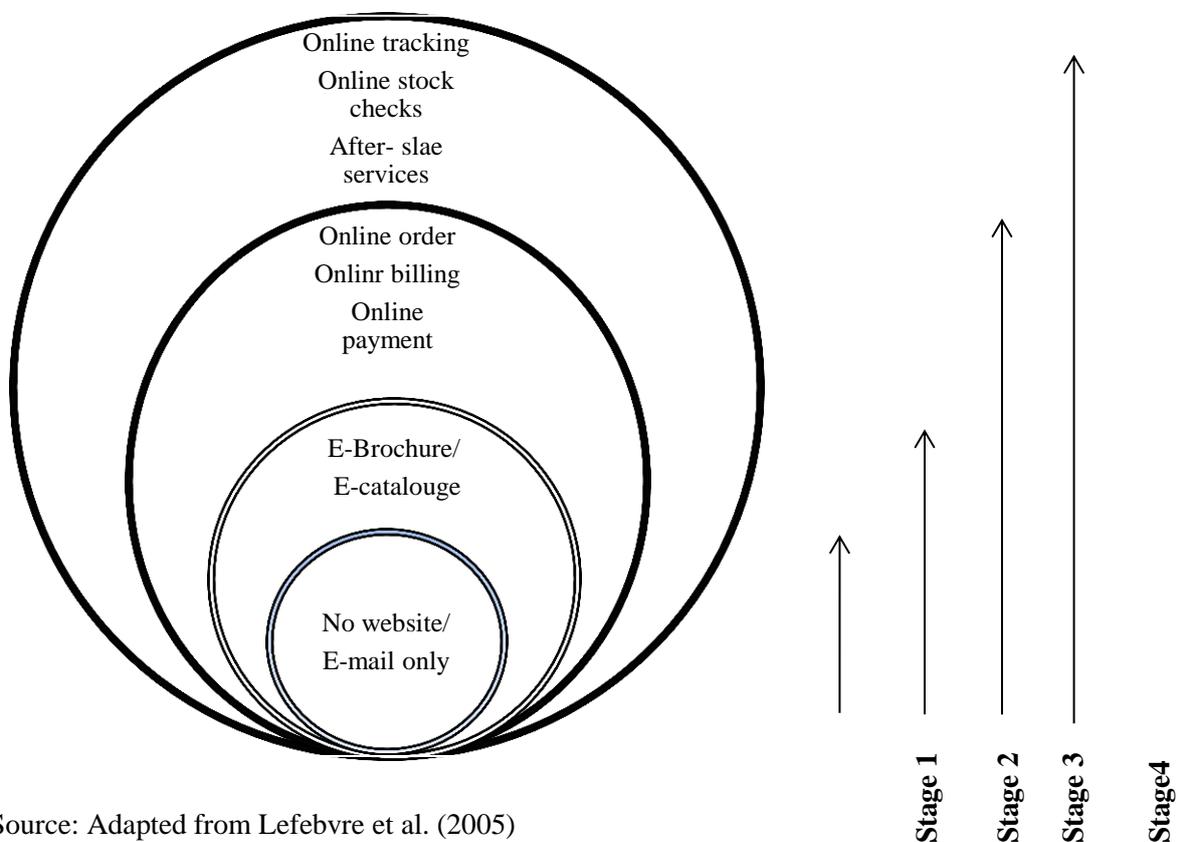
A basic and simple measure, about which it was easy to obtain data, was the question do you use e-commerce? Although this was a simplified measure, it was a reasonable mandate because, if companies used email to make deals, then, actually, they were doing business over the internet and using the technology. Also, this was a generally accepted and widely used measure and it was the only data which could be collected. This measure was employed by many researchers who studied adoption as a subdivided variable (To and Ngai, 2006; Teo and Ranganathan, 2004; Sultan and Chan, 2000; Premkumar and Roberts, 1999).

To some extent, more complicated measures were the questions: how much did you sell through e-commerce? What was the average of e-commerce sales in relation to the company's total sales? This measured the level of adoption by determining the extent to which these companies were engaged in the adoption of e-commerce adoption with those companies with high sales being considered be highly engaged. This was a measure of degree of complexity of adoption which was based around sales but it was difficult to measure since it was more sensitive because, usually, companies did not like to give information on sales or revenue. This measure was quite difficult to collect but it told us something about the degree of commitment of these companies as regards the adoption of e-commerce. Hong and Zhu (2006) used a comparable measure in their study on firms' adoption of e-commerce whereby they used the percentage of revenue from e-commerce sales as an indicator of the extent to which a firm transferred from the traditional method to the e-commerce method. However, both of these measures had their weaknesses and it was unclear which one was best and the respondents did not answer it in the questionnaire.

## 7.2 Level of Adoption of E-commerce

In order to maintain the validity of this research, the researcher constructed the following question about the stage in adopting e-commerce: at what stage did you adopt e-commerce? Lefebvre et al. (2005) used this measure in a study exploring SMEs' B2B adoption of e-commerce adoption. This measure told us much more about the degree of adoption by these companies.

**Figure 7.1: SMEs' Adoption Stages of E-Commerce**



Source: Adapted from Lefebvre et al. (2005)

However, since all the respondents were located in the first stage, it was difficult to divide the results into two sections (simple adopters; and sophisticated adopters) for comparison purposes. All the SMEs, which took part in this research, were considered to be simple e-commerce adopters.

### **7.3 Individual Factors**

As mentioned in the chapter on the literature review chapter (section 3.8.1) and in line with previous empirical results; resource based views; and Roger's model of innovation adoption (section 4.1), individual factors included six sub-factors. These were: age of individuals; gender; education level; position in the firm; top management support; and the top management's attitude toward change. These factors and sub-factors received experimental support from past researches which indicated a significantly positive effect on the adoption of innovation (Sultan & Chan, 2000; Brancheau & Wetherbe, 1990; Lockett & Littler, 1997; Thong, 1999; Corbitt, 2000). Adopters were found to have decision makers' sympathetic acceptance; strong management support; and a positive attitude toward change. The following sections explain each of these factors.

#### ***H.1 The older the decision maker, the more negatively disposed to the adoption of e-commerce.***

Very little empirical research explored the relationships between the employees' ages and their attitudes towards IT initiatives. This hypothesis tried to investigate whether or not if the individuals' ages affected the adoption of technology. The results showed that no significant relationship existed between the decision-makers' ages and the acceptance of technology. These results were on similar lines to those of Rohm and Swaminathan (2004) who stated that there was no relationship between an individual's age and his/her likelihood to use e-commerce. Li et al. (1999) and Bellman et al. (1999) claimed that there was no significant age difference amongst adopters of technology. However, in some studies, the individual's age was found to be a factor which supported effectively the adoption of IT (Busselle et al., 1999). Nowadays, the age gap between online and non-online trade is shrinking; however, the effect of age on the decision -maker's intention to use e-commerce remains unclear. For

example, some studies identified a positive relationship between individual age and his/her likelihood to use e-commerce (Stafford et al., 2004), whereas others reported a negative relationship (Joines et al., 2003). Individual age was surveyed as an interpreter of technology perceptions; acceptance; and use (Morris et al, 2005; Ostroff et al, 2003; Cleveland et al, 1997). Whilst some of these researches reported, amongst older adults, high levels of anxiety and discomfort with technology (Turner et al., 2007).

## ***H.2 The decision maker's gender has an impact on the adoption of e-commerce.***

This hypothesis aimed to investigate whether or not the difference in gender related to the adoption of technology adoption. The results revealed that a significantly positive relationship existed between the gender of the decision maker and the adoption of innovation. These results, which were in line with some researches, claimed that the demographic variables had significant effects on an individual's decision to adopt IT (Busselle et al., 1999; Lin, 1998). Rodgers and Harris (2003) found that men reported greater trust in the acceptance of e-commerce acceptance. Nevertheless, there remained a need for more empirical investigations about its invariance across different respondent demographics in order to ensure that different sample profiles would not have a negative effect on the findings. In other words, gender was not part of the earliest Technology Acceptance Model (TAM) (Davis et al., 1989, p.985), but observed evidence revealed that, in accepting information technology, males and females had different perceptions about its ease of use and usefulness (Gefen & Straub, 1997). Therefore, this hypothesis was accepted in relation to the adoption of technology. The result, of this hypothesis, might be affected by the differentiation of the sample since most (80.8 %) of the respondents were male. This was in the line with statistics of the Egyptian workforce which consisted of 73.8 % men and, 26.2% women (CAPMAC, 2012).

### ***H.3 The higher education level of decision maker, the greater possibility of the adoption of e-commerce.***

This hypothesis aimed to investigate whether or not the adoption of technology was affected positively by the difference in education level. The results indicated a significantly positive relationship existed between the decision-makers' education levels and the adoption of technology. These results were consistent with those of Mayer et al. (1995); and Chen and Dhillon, (2003) who noted that personal factors, such as education, influenced greatly individual trust towards the acceptance of e-commerce. In addition, learning computers and the internet was quite complex for individuals who lacked education (Lu et al., 2006). Friedberg (2001) observed that employees, over fifty years of age, were less likely to have educational training which built IT knowledge and skills. Riddell and Song (2012) mentioned that the higher the level of education attained the faster information technology was adopted. No- one could ignore the importance of education for any nation and its role in economic growth since individuals learnt, through the different stages of education, what was new. Hence, the importance of education in the development of technology since, nowadays, the quality of education was characterised by the density of the used technology.

### ***H.4 The higher position of the decision maker in the firm, the increased possibility of the adoption of e-commerce.***

The decision- maker's position, in the firm, was used to investigate whether or not there was a relationship with the adoption of technology. The results pointed out the existence of a significantly positive relationship between the position in the firm and the adoption of technology. These results were similar to those of Premkumar and Ramamurthy (2007). The more responsibility, in the firm, the more control of the decision about the adoption of e-

commerce adoption and being able to change his/her inclination towards IT. In addition, the greater the level of IT knowledge, amongst functional managers, determined the extent to which the firm would be motivated to adopt ecommerce (Crook and Kumar, 1998; Mehrtens et al., 2001).

### ***H.5 Proactive decision makers are more likely to adopt e-commerce than reactive ones.***

Top management support was investigated to prove whether or not it related to the adoption of technology. The results confirmed that there was a significantly positive relationship between top management support and the adoption of technology adoption. These results were in accordance with those of Premkumar and Roberts (1999); and Beatty et al. (2001) that top management support had a positive role in creating a climate of initiative for the organization's inclination to adopt e-commerce. Similarly, in their study on Irish SMEs, Ramsey *et al.*, (2003) stated that the increasing awareness and understanding of the benefit of e-commerce, amongst SMEs might affect positively their interest in adopting e-business. The owner's lack of knowledge of the technology and perceived benefits was a major factor in the adoption of e-commerce (Lacovou *et al.*, 2005). In terms of supporting the adoption of e-commerce, McCole and Ramsey (2005) stated that owner/managers had to be convinced of the benefits of e-commerce and they ought to be offered continued support for implementing e-business practices. Top management who were positively willing towards the use of e-commerce, were expected to encourage and support e-commerce based innovations. Moreover, top management ought to make available adequate resources such as enough money; time; and human talent for the launch and completion of e-commerce ventures.

### ***H.6 Having positive attitude towards change results in more positive disposition towards the adoption of e-commerce.***

This hypothesis was meant to investigate whether or not the adoption of technology would be affected positively by top management's attitude towards change. The results showed that there was a significantly positive relationship between top management's manner regarding change and the adoption of technology. These results revealed that, when thinking about changing from the traditional ways of doing business to the e-commerce service, management's attitude regarding change did affect firms' adoption/non-adoption decision, whether they were conservative or more willingness to make a change. These results were in line with those of Fillis et al., (2004) that the proactive owner/manager, of a smaller firm, was more likely to adopt Internet technology. These results agreed, also, with Premkumar and Roberts (1999) that top management could influence the degree of the firm's adoption of e-commerce adoption. In addition, if the top management was dynamic and more involved in understanding IT, they were more likely to be positive towards new innovations (Abukhzam and Lee, 2010).

## **7.4 Organizational characteristics**

Grounded in the literature review (section 3.8.2) and the conceptual framework which considered the resource based view of the firm (Grant, 1991) (section 4.2), organizational factors, affecting the adoption of innovation, were: company activity; financial resources; size of company; employees' IT knowledge; and marketing capabilities. More analysis of each of these factors is clarified in the interpretation of the following hypotheses.

### ***H.7 The types of products/services determine the level of adoption of e-commerce.***

This hypothesis aimed to explore whether or not the adoption of e-commerce was affected positively by type of product/services. The results indicated that the existence of a significantly positive relationship between the SME activity type and the adoption of e-commerce. These results were consistent with those of Pohlen (1996) that the cost of a firm's activity was related to the acceptance of such a new innovation. The enterprise's activity influenced the adoption of e-commerce (Olatokun and Kebonye, 2010). Filiatrault & Huy (2006) found that variables, such as enterprise type of activity, had an impact on the adoption of e-commerce. Similarly, Fillis et al. (2003) stated that the type of product could inhibit small firms from adopting e-commerce. These results meant that if the firm's products/services could be used more easily, by ICT, this would enhance the firm's adoption of e-commerce technologies. This would lead to more efficient business processes and improve the firm's performance.

### ***H.8 The larger the firm, the more likely the adoption of e-commerce.***

The size of the firm size was used to investigate whether or not it related to the firm's ability to adopt e-commerce. In some studies, the size of the business size was considered to be an important interpreter of the adoption of IT innovations. However, some empirical results, on their relationship, were mixed and inconsistent. The results of this hypothesis showed that a significantly positive relationship occurred between the size of the firm size and the adoption of e-commerce. These results were in line with those of McDonagh and Prothero (2000) that there was a correlation between the size of a firm and the level of adoption of e-commerce. This view was agreed equally by Olatokun and Kebonye (2010) who concluded that the size of the enterprise influenced its adoption of ecommerce and its size could impede this

adoption. This was consistent, also, with that of Freeman et al. (2003), who stated that the size of the business had a significant impact on the adoption of new technologies. However, for a long time, organizational size was considered to be an important predictor of the adoption of IT innovation. However, empirical results, on the relationship between them, were disturbingly mixed and inconsistent.

#### ***H.9 The more assets in the firm, the more likely the adoption of e-commerce.***

Access to financial resources of a firm could play a vital role towards the adoption of new innovations. Consequently, the researcher used this imposed hypothesis to investigate if there was a relationship between the firm's financial ability and the adoption of e-commerce. The results showed the existence of a significantly positive relationship between the firm's capital and the adoption of e-commerce. These results were consistent with Lacovou et al. (1995)'s findings that the more access small firms had to financial resources, the more chance they had to be equipped with integrated EDI systems. Premkumar and Potter (1995); Thong (2001) stated that small firms, with better financial resources, had more ability to adopt e-commerce. These agreed, also, with Alamro and Tarawneh (2011) who stated that the firm's financial resources played an important role in the CEO's decision to adopt e-commerce. SMEs were characterised by a dearth of financial resources. Fillis et al. (2003) agreed with this view and mentioned that small firms did not have the financial capabilities to adopt e-commerce and to train their employees to use it.

#### ***H.10 The more experience in the market, the more likely the adoption of e-commerce.***

Some studies claimed that the age of the business had no relationship to the adoption of e-commerce adoption. However, other researches stated that a relationship existed between them. The researcher suggested this hypothesis was to investigate whether or not this type of

relationship was present. The results revealed that no significant relationship existed between the age of the business and the adoption of e-commerce. These results were consistent with Bertschek and Fryges (2002) who revealed that there were no significant effects of the age of the firm on the adoption of Business- to-Business e-commerce. These meant that, in general terms, SMEs were likely to slow down innovative activities. However, nowadays new firms were likely to be small and more innovative towards e-commerce especially to its benefits; the government introduced facilities and support for these SMEs. On the contrary, in developing economics, SMEs did not receive sufficient support from public organisations and government department concerning the use of e-commerce. This might be back to the limitations of these economics and the lack of financial resources which resulted in poor telecommunication services

### ***H.11 The higher IT knowledge of employees, the increased possibility of e-commerce adoption.***

It was expected that awareness; understanding, and know-how could contribute to the adoption of innovative technologies. However, some research stated that IT knowledge had no relationship with the adoption of such innovations. From this point, the researcher imposed this hypothesis to investigate whether or not there was a relationship between the firm's employee IT knowledge and the adoption of e-commerce adoption. The results showed that a significantly positive relationship existed between employee IT knowledge and the adoption of e-commerce. These results were consistent with those of Mirchandani and Motwani (2001) that the company's employees' knowledge about computers and the perceived relative advantages of IT were found to have a relatively large positive correlation with the adoption of e-commerce. Thong (1999) stated, also, that the small business' employee ability to innovate and IT knowledge influenced positively the adoption of

innovative technologies. This could be explained since employees' IT knowledge was expected to promote adoption rather than impeding it

### ***H.12 Increased use of internet marketing is associated with higher levels of e-commerce adoption.***

Despite researches examining the influence of marketing capability on innovation being quite finite (Benedetto et al., 2008), some studies showed that marketing capability had an effect on the success of the firm's product/ services. Consequently, the researcher supposed this hypothesis was to explore if there was a relationship between the firm's marketing capability and whether or not it adopted e-commerce adoption. The results showed the existence of a significantly positive relationship between marketing capability and the adoption of e-commerce adoption. These results were in line with those of Simmons et al. (2007) who stated that marketing capability had a strong impact on UK agri-food firms' adoption of the internet. Similarly, Leskovar-Spacapan and Bastic, (2007) found that marketing capabilities had a positive relationship with the adoption of innovative technologies. The firm's resources and skills related to Internet marketing could enable it to add value to its products/ services in order to meet the competitive demands of the market (Day, 2005). It appeared that the marketing capability of export and import business could enhance the company's performance and improve their ability to market their products/ services locally and internationally.

## **7.5 Characteristics of E-commerce**

This section discusses the impact of e-commerce properties on the decision to add e-commerce to a firm's means of selling as discussed at section 3.8.3. An e-commerce characteristic referred to the features which affected SMEs' owners/managers evaluation and assessment of e-commerce's usefulness and ease-of-use as discussed (section 4.5).

### ***H.13 Increasing geographical distance within a B2B relationship relates to a higher chance of e-commerce adoption.***

Geographical distance was used as an independent variable to investigate whether or not there was a relationship between the location of the market and the adoption of e-commerce. The results showed that there was no significant relationship between geographical distance and the adoption of e-commerce. In traditional trade, it was known that the location of the market location affected the firm's preferences when deciding to go international. Fillis (1999) indicated that it was desirable for smaller firms to target those markets which were close in geography and similar in culture.

Also, Wong (2003) stated that e-commerce was expected to lead to the "death of geographic distance," and the dependence on the advantage of geographical location was likely to disappear. However, from the results, in section (5.3.5), it seemed that Egyptian SMEs preferred still to target markets which were close in location and culture; this reflected Egyptian SMEs' degree of adoption of e-commerce adoption.

### ***H.14 The more availability of communication tools the higher the possibility of e-commerce adoption.***

This hypothesis was used to investigate whether or not there was a relationship between the attributes of communication tools and the adoption of e-commerce adoption. The results showed the existence of a significantly positive relationship between communication elements and the adoption of e-commerce. These results were in line with those of Glushko et al. (1999) who stated that the communication tools' attributes including EDI and internet had an important role in the adoption of e-commerce. Firms used these tools to keep up to-date with their business partners and to share expertise; ideas; and corporate information. Each

tool's characteristics and degree of availability would determine its role in the adoption of the technology. It could be used, also, as an aid in making a technological decision. This would help to determine the level of the adoption of e-commerce especially since it could use more than one tool at any one time.

### ***H.15 Increasing levels of research by the company are associated with the higher levels of e-commerce adoption.***

There were insufficient empirical researches concerning the status of e-commerce in Egypt. This imposed hypothesis aimed to investigate whether or not conducting sufficient empirical researches on e-commerce would affect the degree of adoption of e-commerce. The results showed the existence of a significantly positive relationship between conducting researches on e-commerce and its adoption. Mansfield (1998) stated that the information technology process was developed recently based on academic research; however, some new products had not been developed due to the absence of academic research. There were a lot of benefits which could be gained from empirical researches since these enhanced the understanding of new innovation and showed the encountered difficulties which could be investigated by both academics and practitioners. Academic researchers were used, also, to develop a series of proposals which could guide future empirical researches. As regards Egypt, the researcher considered that further empirical research on e-commerce is needed to enhance Egyptian SMEs' understanding of the adoption of e-commerce.

### ***H.16 The more the company engages in future strategies, the more likely it is to adopt e-commerce.***

The e-commerce strategies were used to investigate whether or not these had a relationship with the adoption of e-commerce. The results showed the existence of a significantly positive relationship between e-commerce strategies and its adoption. These results were consistent

with Grando and Pearso (2004) who stated that managers, who perceived e-commerce as adding strategic value to the firm, had, also, a positive attitude towards the adoption of e-commerce. Daniel (2002) stated that a firm's development of an e-commerce strategy was influenced by the manager's awareness of the benefits of e-commerce. Consequently, e-commerce could be a strategic aid for managers when they made decisions.

### ***H.17 Higher usage of B2B relationships result in increased levels of e-commerce adoption.***

Today, the main challenge, for many SMEs, is to learn how to manage, organise and advance daily business activities in the performance of B2B e-Commerce. Building networks and relationships are believed to be very important for business success. This hypothesis aimed to inspect whether or not the firm's relationship with other parties affected the adoption of e-commerce. The results revealed that the existence of a significantly positive relationship between businesses' relationships and the adoption of e-commerce. These results were consistent with those of Lacovou et al. (1995) who studied the adoption and impact of electronic data interchange on small organizations. They stated that support, from partners, enhanced greatly the technology's integration of the firm. Kraemer et al. (2000) revealed further evidence that the adoption of e-commerce led to improved productivity and coordination with trading partners. The relationship, between the SMEs and government agencies, was believed to be important at the early stages of the involvement of e-commerce. Businesses relationship could act, also, as a 'good reference' source for other buyers. Building up successful business relationships would result in high levels of trust and would indicate a possible growth in the firm's performance. It was believed that the decision to adopt e-commerce would be affected by other business partner's characteristics, for example, if business partners were using e-commerce within their firms, this would encourage the

owner/manager to adopt e-commerce. However, if they preferred to use the traditional way of selling, this would impede the firm from adopting e-commerce

***H.18 The more tasks involved, the more likely the firm is to adopt e-commerce.***

It was believed that the use of e-commerce would change the firm's duties. Some studies claimed that e-commerce improved the firm's tasks, whilst other argued that some tasks were unaffected by the adoption of e-commerce. This might be as a result of some factors surrounding the firm. The researcher considered that this was an overlapping relationship. For that purpose, this hypothesis aimed to investigate whether or not the performance of the firm tasks/duties performance were related to the adoption of e-commerce. The results showed the existence of a significantly positive relationship between the impact of the firm's tasks and e-commerce. These results were in line with those of Baourakis et al.(2002) who studied the impact of e-commerce on agro-food marketing. In this regard, they stated that the impact of e-commerce on the firm's marketing was very important and vital for future business. In studying e-commerce and corporate strategy, Chan et al., (2003) stated that, in the process of forming a corporate strategy, the firm ought to analyze its industry activities in order to identify opportunities for IT innovation. However, Gallagher and College (2002) stated that, when it came to understanding the impact of online commerce on existing channels, many managers were confused between potential opportunities and recognizing the existing threat. Chaston (2002) stated that e-commerce enabled the company to offer a new range of support services which it would result in more customization.

## **7.6 E-readiness**

Various researches recognised the importance of e-readiness factors on different approaches to adopting e-commerce (section 3.8.4 & 4.4). B2B e-commerce systems required to be flexible enough to organise the changes' ability to handle the growth of data.

### ***H.19 The more e-ready the firm is the more it is likely to adopt e-commerce.***

With regard to e-readiness, this hypothesis aimed to investigate whether or not the firm's electronic readiness related to the adoption of e-commerce. The results showed the existence of a significantly positive relationship between e-readiness and the adoption of e-commerce. These results were in line with those of Molla and Licker (2005) who studied the e-readiness factors, in a developing country, to adopt e-commerce. They stated that e-readiness factors were identified as both significant and positive and had a major effect on the adoption of e-commerce. Bui et al. (2003) conducted a study measuring national e-readiness. They stated that the higher the e-readiness score, the higher the country's ability to compete in the new digital economy. Mutula and Brakel (2006) studied SMEs' e-readiness in Botswana. They stated that the low adoption level of e-commerce, amongst SMEs, resulted from the country's low e-readiness. These results reflected the importance of a technological infrastructure and how it affected e-commerce practice. The same was true for the internet quality and speed which had a vital role on the effectiveness of data transfer.

## **7.7 Government Support**

In many nations, SMEs represent a huge sector in the national economy. The government ought to support SMEs to use new innovations to improve their performance and stimulate their revenues which would improve the country's economy.

## ***H.20 Increasing levels of government support result in increased levels of e-commerce adoption.***

There were mixed results from studies on the effect of government support on the adoption of innovations. This hypothesis aimed to investigate whether or not government support related to the adoption of e-commerce. The results revealed the existence of a significantly positive relationship between government support and the adoption of e-commerce. These results were in line with those of Chan and Al-Hawamdeh (2002) who studied government initiatives and the development of e-commerce development in Singapore. They stated that the government initiatives had a strong impact on businesses' adoption of e-commerce. In the case of developing countries, Ang et al. (2003); Montealegre (1999); King et al. (1994) stated that the role of government was an important consideration which affected the adoption of innovation. However, Howcroft and Mitev, 2000 stated that government support factors were complex and were affected by demand side factors. The government and private sector partnerships ought to be involved in a campaign to circulate information to SMEs about e-commerce policies; success stories; and opportunities which could be gained from adopting e-commerce. Consequently, the government had a big role in building distinctive strategies to increase SMEs' use of e-commerce. Since SMEs were characterised by a lack of financial resources, the government ought to provide financial help by offering them grants and subsidising as well as encouraging the banking system to offer financial support for SMEs to use e-commerce.

### **7.8 Barriers to E-commerce**

MacGregor and Vrazalic (2005a: 524) mentioned that barriers changed over time and, consequently, a new list of e-commerce barriers emerged. However, Ihlstrum et al. (2003, p158) argued that the hindrances of e-commerce adoption, reported earlier in the late 1990's, continued to be the same for today's SMEs. Therefore, the barriers, included in this factor,

were both external and internal barriers and standing, in the surrounding environment, which might influence the adoption of e-commerce. The following section discusses this in more detail (section 3.8.6 & 4.4).

### ***H.21 The more barriers the more negative the impact on the adoption of e-commerce.***

From this point, the researcher proposed, as a hypothesis, e-commerce barriers to investigate whether or not they had a relationship with the adoption of e-commerce adoption. The results showed the existence of a significantly negative relationship between e-commerce barriers and the adoption of e-commerce. These results were in line with those of Kshetri (2007) who studied barriers to e-commerce and competitive business models in developing countries. He stated that there were many factors which impeded the diffusion of e-commerce in developing countries. These barriers were such as unavailability of an online payment system; slow internet diffusion; low bandwidth availability; weakness of a physical delivery system; lack of legal protection for internet purchases; lack of business laws for e-commerce; and a lack of awareness and understanding of potential e-commerce opportunities. Another study, conducted by Hunaiti et al. (2009) on e-commerce adoption barriers in Libyan SMEs, stated that the most important factors, which inhibited the adoption of e-commerce in Libyan SMEs, were the lack of experience with online trading; fear of conducting online transactions; and absence of business laws for e-commerce.

## **7.9 Summary**

This chapter aimed to present and to discuss the research's empirical findings. It attempted, also, to explain the relationships of results to past works on the adoption of innovation and e-commerce. In addition, it highlighted the potential influence of the factors affecting the

adoption of e-commerce and figured out the positive and negative impacts of Egyptian SMEs adopting e-commerce. This chapter presented the main findings obtained from testing hypotheses. It was found that individual and management factors had a relationship with the initial decision to adopt e-commerce and, with the exception of managers/owners age, there was no relationship to the adoption decision. Organisational characteristics factors showed an important relationship to the adoption of e-commerce adoption excepting that the age of the firm had no relationship to the adoption of e-commerce. E-commerce characteristics were shown to impact on the adoption with the exception of geographical distance which had no effect on the adoption decision. E-readiness and government support factors were important in facilitating the environment to encourage SMEs to adopt e-commerce. Barriers to the adoption of e-commerce adoption were tested and shown to have a negative impact of the adoption decision. The next chapter presents the research conclusion; and suggestions and recommendations for future researches linked to the adoption of e-commerce.

**CHAPTER EIGHT**

**Research Conclusion;**

**Recommendations; Limitations;**

**And Future research**

## **8.0 Introduction**

This thesis investigated empirically, in an Egyptian context, the SMEs' adoption of e-commerce.

Chapter eight concludes the study by addressing the following features of the thesis:

- An indication of what was achieved;
- A review of the thesis' research hypotheses and their results;
- An overview of the relevance of the study;
- Theoretical contributions;
- Practical contributions; and
- An outline of the recommendations; study implications; and future research.

## **8.1 The Findings from the Review of Existing Models**

From the reviewed models, it could be highlighted that the greater the adopted e-commerce the greater benefits and highlighted efficiencies were achieved. It is believed, from this research, that a greater investment in e-commerce resources can result in an extra positive impression on achievable benefits for a business. However, this underlying finding did not prove that a higher level of adoption of e-commerce adoption was connected indisputably to a greater benefit or successful application; there was no specific model, method or formula, between the adopted e-commerce and a successful business operation which guaranteed automatic success. It put forward simply a greater rate of success. The majority of the analysed models corresponded with an increased level of adopted e-commerce assisted firms in the effective improvement of their businesses. Some research showed that, at the integration level after primary adoption, was where the greatest increase in benefit could be obtained. The analysis of the existing models showed that an extent method could be useful in determining the integration of effective business practice, and predicting potential influences of change.

These hypotheses were taken forward in the development of the new model associated with this research. This research suggested convincingly that a detailed analysis and continuous evolution of a business could result in greater benefits from the adoption of e-commerce. With the employment of planning and observing techniques, which embrace organisational values, a detailed picture of a company, from using technological and non- technological approaches, could be constructed successfully. A business' function could be affected by changes, and observing provided a tool to ensure that selected changes were the correct ones for progressive development. However, it was well known to be difficult to measure developments, particularly when trying to associate particular changes with achieved

benefits. The development of a strategy was fundamental and ought to employ all previous knowledge.

This study spotted the obvious factors which could influence the success of the adoption of e-commerce and this effect could be to a greater or lesser degree. These six factors (individual characteristics; organisational characteristics; e-commerce characteristics; e-readiness; government support; and e-commerce barriers) determined collectively the likelihood of the adoption of e-commerce. In order to complete an extensive adoption profile, organisational readiness; compatibility; political pressure and socio-economic pressure needed to be addressed. These elements were, in themselves, the adoption and, therefore, were necessary in both defining and supplementing the adoption strategy.

## **8.2 The Findings from the New Model**

It was very important that an organisation, adopting such a new innovative development could see obviously how and where it would fit into the existing business context and to know where it was going for the implementation of a business strategy. Detailed analysis and a business' continuous evolution could result in many benefits from adopting new technology. From the examination of many detailed models, during this research's review stage it was possible to construct the sixth model (individual characteristics; organisational characteristics; e-commerce characteristics; e-readiness; government support; and e-commerce barriers) which could aid further the process of the adoption of e-commerce by SMEs. The foundation base, of the target model, was planned as a tool to fit quantifiable and descriptive measurements. The conclusions from this research signified that e-commerce initiatives were seen by the organisation, which operated it, as the most significant. It was accepted broadly that the benefits and related indirect benefits, of adopting new technology, were greater than their associated cost.

### **8.3 Theoretical Contributions**

This research contributed to the knowledge in defining e-commerce since this was an implementation of all operations related to buying and selling goods/services and information via the Internet and other global networks. These included:

- Marketing for products and services.
- Interaction and negotiation between buyer and seller.
- Making transactions and finalising contracts.
- Payment of financial responsibilities.
- Distribution and delivery of goods and follow-up procedures.
- Customer services before and after sales.
- Electronic Data Interchange (EDI); this included prices; correspondence mechanism associated with buying and selling; and electronic invoices and banking transactions.

This research's most important contribution was an experiential contribution through studying the concept of Egyptian SMEs adopting e-commerce. This was considered to be an important extension to the adoption of e-commerce studies which had focused largely on developed countries. As mentioned earlier in the literature review chapters, Rizk (2004) conducted a survey of 36 Egyptian SMEs to investigate these firms' e-readiness to adopt e-commerce. This study investigated infrastructure readiness; education and knowledge of ICTs; human capital; actual and perceived use of ICTs; and barriers to implementing ICTs. However, their study did not focus on the factors affecting these companies' adoption of e-commerce including individual factors; organisational characteristics; and government support. Most researches, conducted in the Egyptian context, were from a B2C perspective. Additionally, Al-Sahouly (2012) conducted recently a study of e-commerce in the Egyptian context. This study was from a B2C perspective to address the Egyptian consumers' perception towards the use and adoption of e-commerce. The study aimed, also, to discover

the benefits/barriers and the incentives to use online shopping in Egypt. Moreover, even the most recent study (Zaied, 2012) conducted on Egyptian SMEs' adoption of e-commerce adoption focused on the Egyptian SMEs' barriers to adoption of e-commerce. This study aimed to investigate factors which hindered the adoption without focusing on one prospective B2C or B2B. Also, it did not take in account the factors which influenced the SMEs' adoption of e-commerce including e-commerce characteristics; organisational characteristics; and government support. However, this research was considered to be the first research to be conducted on Egyptian SMEs' adoption of e-commerce from a B2B perspective. Accordingly, through this empirical contribution, this study made an initial contribution toward the current body of knowledge on SMEs' adoption of e-commerce. In this manner, this research's empirical contribution was its capability to classify the vital factors which affected small and medium companies' adoption of different levels of e-commerce. For example, individual factors were found to be an important factor affecting the likely adoption of e-commerce.

This research's theoretical suggestions were The Diffusion Of Innovation (DOI) (Rogers, 1983), the Resource-based View (RBV) of the firm (Barney,1991); The Technology–Organization–Environment (TOE) Model (Tornatzky and Fleisher,1990); and The Technology Acceptance Model (TAM) (Davis, 1986 ) to determine the relationship between six groups of factors which were individual factors; organisational characteristics; e-commerce characteristics; e-readiness; government support; e-commerce barriers; and adoption of e-commerce. These theoretical integration models (RBV and TAM) were used rarely to serve the B2B prospective in the context of adopting innovation. Some studies developed factors including company size; company age; and employees' IT knowledge which might well be counted as firm resources. However, these were not done in a

systematic way and, hence; the adoption was not hypothesised in this way. This research found that e-commerce characteristics were not the whole story when studying firms' adoption of e-commerce. Individual factors and organisational characteristics affected, also, firms' adoption decisions whereby management support and attitude towards change were found to affect the likelihood of adoption and marketing capabilities were found to influence high levels of adoption.

Zhu and Kraemer (2002) used financial measures to value the firm's assets from the adoption of e-commerce since they believed that these measures were the best for assessing the business value of Internet-enabled initiatives. Therefore, they measured performance by three dimensions: profitability; cost reduction; and inventory efficiency. However, due to the cultural factors and, in the Egyptian environment, the sensitivity of the firm's financial issues, the researcher adopted gained business benefits (as a dependant variable) as a result of adopting e-commerce to overcome this problem. This was because the majority of respondents did not answer the questionnaire's questions 35, 36 and 37 which related to the annual e-commerce sales and the firm's total annual sales. Subsequent sections review the research findings regarding the effect of each of the six groups of factors on the adoption of e-commerce.

### **8.3.1 Individual factors**

As stated in the literature review chapter, individual factors, related to the SMEs' adoption of e-commerce, were significantly positive. This was the case when the owner/top managers made all the decisions which affected the firm's performance and their individual characteristics inspired the decision to adopt e-commerce. The six studied individual factors were age; gender; education level; position in the firm; top management support; and

management's attitude toward change. With the exception of owner/top manager's age, these were all found to have a significant positive relationship on the adoption of e-commerce.

Top management support had a highly significant positive association with adoption and, consequently, the support of owner/top management was vital when thinking whether or not to adopt e-commerce. In the more detailed study, top management ought to support, in the first place, the idea of adoption since they influenced adoption/non-adoption and, also, the degree of adoption.

Finally, in the same way, management's attitude, towards change, had a significantly positive relationship with the adoption. This indicated that, when considering a shift from the traditional ways of doing business to e-commerce, management's attitude towards this change, whether they were willing or against making a change, affected the adoption/non-adoption decision.

### **8.3.2 Organisational characteristics**

As for organisational characteristics, six factors (activity type; firm employment level; firm's capital/ assets; company age; employees' IT knowledge; and Marketing capability) were investigated in relationship to the adoption of e-commerce. With the exception of age, all factors related positively to the adoption of e-commerce. Employees' IT knowledge was found to relate positively to the adoption of e-commerce since, if the employees had a sufficient background about ICT and computers literature, this would stimulate the state of adoption and would generate many benefits to the firm.

Additionally, marketing capability was found, also, to have a significantly positive relationship to the adoption of e-commerce since it dealt with the SME's ability to develop;

promote; and distribute their products/services over the Internet. Therefore, when it came to higher levels of adoption of e-commerce, having the ability to market their products/services on the Internet became fundamental.

### **8.3.3 Innovation Characteristics**

E-commerce characteristics were the relative advantages to the firm from adopting this technology. In this approach, the researcher tried to figure out the most important e-commerce characteristics in order to investigate if these affected whether or not the firm adopted e-commerce.

This provided the means for evaluating potential results depending on changes of business environment. Six factors (geographical distance; communication tools; e-commerce research; future strategies; relationship with other parties; and company tasks) were used to investigate their relationship with the adoption of e-commerce. All factors related positively to the adoption of e-commerce with the exception of the geographical distance which did not show any relationship to the state of adoption. This was unlike traditional commerce since geographic distance was considered to be an important factor on the choice of international markets. E-commerce helped firms to have new customers; suppliers; distributors; and enabled retailers to enlarge the circle of business contacts without difficulty since it was easy to reach many markets and, also, to build up new business partners. Significantly, firm tasks related positively to the adoption of e-commerce since it improved the business process; developed marketing tools; enhanced the distribution system and provided more choice of financial/ fund resources.

### **8.3.4 E-Readiness**

E-readiness referred to the assessment of the level of e-commerce supported by the availability of technologies (Internet services; devices; software; and maintenance) and other support-giving agencies. Significantly, e-readiness was found to relate positively to the adoption of e-commerce. This might refer to the availability degree of Internet services and its cost which ought to be at a low cost to encourage SMEs to use e-commerce. Consequently, the Internet quality and speed played a vital role in the effectiveness of data transfer and affected the e-commerce performance.

### **8.3.5 Government Support**

The results revealed the existence of a significantly positive relationship between government support and the adoption of e-commerce. This relationship was vital to the likely adoption of e-commerce and, also, the sophisticated level of adoption. The government ought to be involved in a campaign to circulate information to SMEs about e-commerce policies; success stories; and opportunities which could be gained from adopting e-commerce. Consequently, the government had a big role in building distinctive strategies to increase SMEs' use of e-commerce. In the meantime, SMEs were typified by a lack of financial resources. The government ought to provide financial support by offering them subsidies and grants and reassuring the banking system to offer SMEs financial support to use e-commerce.

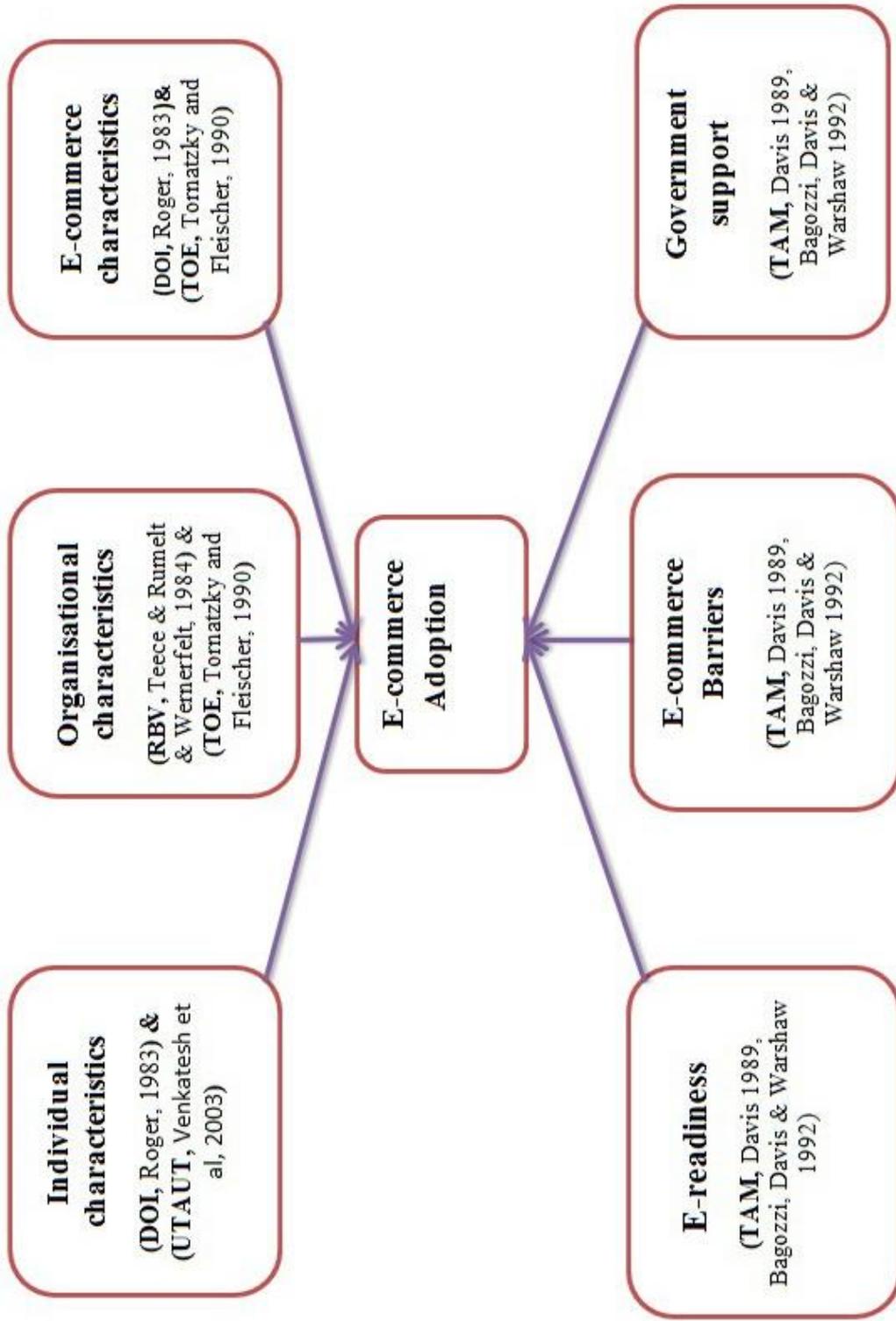
### **8.3.6 E-commerce Barriers**

The results showed the existence of a significantly negative relationship between the e-commerce barriers and the adoption of e-commerce. The most important factors, hindering the Egyptian SMEs' adoption of e-commerce were lack of banking system facilities; lack of awareness of e-commerce benefits; absence of legislative and legal structures; services

quality, if the ICT lacked racial confidentiality and security and lack of trust between trading parties These findings indicated that more efforts were needed to help and stimulate Egyptian SMEs to speed up the adoption of e-commerce, especially the more advanced applications.

In summary, these results indicated that SMEs, in developing countries, were still far from the full utilisation of e-commerce and the adoption of e-commerce was influenced by different factors. The proposed model tried to identify the most important factors which affected the adoption of e-commerce. This was especially from the managerial point of view in order to help SMEs' owners/top managers of to have a wider idea about the e-commerce environment and factors which could be taken into account when their firms were thinking or deciding to utilise e-commerce.

Figure 8.1: Modified Conceptual Model of the Factors Affecting the Adoption of E-commerce by SMEs



This model (figure 8:1) added many things at the general level. Firstly, the individual factors which were not only management support but, also, top management attitudes towards change. This research found, also, that demographic factors could affect the adoption of e-commerce. Some research included the decision maker's position of as a factor which could affect the adoption of e-commerce. However, the owner/top management's education level and gender were not used previously in the context of SMEs' adoption of e-commerce.

Secondly, organisational characteristics affected, also, firms' adoption decisions whereby marketing capabilities were found to affect the level of adoption. Hence, incorporating Resource Base-view and Technology Acceptance Model (TAM) offered a theoretical framework for studying the firms' characteristics. There had been no previous research on this topic. Previously, e-commerce properties were not studied in this organised way. Geographic distance had not been used before as factor which might affect the adoption of e-commerce; some studies showed that one of benefits from the adoption of e-commerce was zero geographic distance but this was not used as a measurement tool.

Many studies indicated the important of the academic researchers. However, there was no study which used the academic research on e-commerce as a tool in factoring what might affect the adoption of e-commerce. Especially in Egyptian context, there was insufficient research on e-commerce. Since academic researches helped to provide a better understand of such new innovations, this might refer to the SMEs' low level of the adoption of e-commerce.

This research was a representation of this theory. The model, presented in this research, was a mixture of the firm's Resource-based View (RBV); and the Technology Acceptance Model (TAM). At the context level, this research was considered to be the first study conducted on Egyptian SMEs from a B2B perspective in relation to export and import activities. It

represented an important extension to the adoption of e-commerce studies which focused mainly on developed countries and where no previous empirical work had been conducted.

Furthermore, it was important to understand that it was fair to generalise all theses' results to all contexts but only if these could be applied to contexts which were similar to Egypt's or might be of relevance, also, to Egyptian SMEs in other sectors. These similarities included SMEs in IT sectors; the medical and pharmaceutical sector; and the chemical sector. In addition, having a culture which was close to the Egyptian culture was another similarity which might indicate the generalizability of the results. This research's results might be generalizable to countries similar to Egypt such as Saudi Arabia; Sudan; Yemen; and Jordan.

#### **8.4 Contributions to Practice**

SMEs' managers were willing to define the most sympathetic techniques in increasing their profits and marketing their products/services to different businesses/customers. They made, also, an effort to target new markets; to create new customers; and to strengthen existing relationships in order to stimulate the firm's performance.

This study aimed to measure and characterise the adoption of e-commerce; determine the factors leading to its adoption; and to evaluate the impacts of the adoption of e-commerce between Egyptian SMEs. It was important for any research to add to the body of knowledge within the field of study. Possibly, policy makers could use this research's results to expand more focused policies in order to stimulate SMEs in the trade sector to adopt and use e-commerce. This research's results offered the following suggestions for policy makers and owners/managers.

Firstly, the adoption of e-commerce adoption took place in levels and different factors influenced different levels. Consequently, public and private agencies, supporting the

adoption of e-commerce, ought to realise relevant factors to each level when, in the adoption context, they targeted to support SMEs.

Secondly, individual factors influenced greatly the decision to adopt e-commerce and these factors were the primary driver for such a decision. Management support indicated a significant relationship with the adoption of e-commerce which suggested that individuals had a very strong influence on the decision whether or not to adopt e-commerce.

Moreover, it recommended that there ought to be more efforts to increase management's awareness of the importance of the adoption of e-commerce and the benefits which it could generate for the firm. Additionally, management's attitude towards change had a significantly positive relationship with the adoption of e-commerce and affected the firm's decision whether or not to adopt e-commerce. This result might indicate that the firm owner/managers ought to have positive attitudes towards the important of communications and the positive benefits which could be brought to the company. Also, managers ought to communicate with employees to explain how their tasks and duties would be affected as a result of adopting e-commerce.

Thirdly, marketing capabilities were discerned to have a significantly positive relationship with the adoption of e-commerce. The results indicated, also, that all the SMEs were in the first stage of the adoption of e-commerce which might be the reason for no firm having its own website which could be used as a marketing tool. Therefore, it was important for managers, when they thought to move from simple to high-level of adoption, they ought to concentrate on expanding the necessary capabilities which allowed them to market their products/ services online. This required that the government ought to focus on offering the infrastructure at a level which enabled online transactions to be finalised.

Fourthly, e-commerce attributes showed a significant relationship to the adoption of e-commerce. Relative advantage could be an influential factor indicating that SMEs might choose not to adopt e-commerce because of a lack of awareness about the benefits which e-commerce could bring to their businesses. Therefore, increasing SMEs awareness, of the benefits of the adoption of e-commerce, ought to affect positively the adoption of e-commerce. Increasing awareness could be achieved through providing better education and more training.

Fifthly, employees' IT knowledge showed a significant relationship to the adoption of e-commerce. This might suggest that companies ought to train their employees on how to use the Internet and e-commerce in order to reduce the resistance which they might have towards this new application and to reduce the level of complexity which they might face when using it.

Sixthly, the government and banks ought to build the necessary infrastructure to allow online payment of e-commerce to be conducted. The government had, also, an important role to regulate the cyber laws to regulate online transactions and to protect against theft and hacking problems.

Conclusively, this research summarises the factors which influenced SMEs in adopting e-commerce. Understanding these factors helped SMEs owners/ managers with a well-studied framework, which could support them with their decisions on e-commerce adoption strategies, through developing management factors which affected the adoption of e-commerce. In addition, it might provide useful information to the firms which, as yet, had not utilised e-commerce, in helping them to reassess their decisions towards adoption.

## 8.5 The Study Recommendations

After going through previous studies on the adoption of technology and e-commerce along with the results acquired from the empirical investigation on Egyptian SMEs' adoption of e-commerce, this study was able to offer the following recommendations on micro and macro levels which ought to be taken into account in the further development of e-commerce strategies:

- 1- Stimulating the adoption of e-commerce needs a lot of effort from the government which should have long-term plans for e-commerce development.
- 2- The government and banking system should introduce financial and technical support for enterprises especially for SMEs to encourage the adoption of e-commerce since such SMEs are the lifeline for developing countries' economics.
- 3- The government should develop the administrators' knowledge of different sectors by establishing workshops and international conferences to spread the importance of e-commerce and transfer other countries' experiences to emphasise that, nowadays, the adoption of e-commerce is not a luxury choice but because the economy needs to support the national income and stimulate international trade.
- 4- The government should expand the role of International Trade Points (ITPs) due to its vital role, in international markets, not only in supporting products and solving problems but, also, in spreading the awareness of the importance of the adopting of e-commerce. In addition, it should start to build public or private enterprises which should specialise in e-commerce services; supply necessary information data about different products/services; help to find opportunities in international markets; and facilitate the completion of e-commerce deals.

- 5- Upgrade the information technology infrastructure by increasing speed; boosting efficiency; and reducing the cost of landline services and communications networks in order to cope with the global communication services.
- 6- For many reasons, the government should stimulate the country's information and communication hardware industry such as reducing the cost of ICT tools; creating more jobs opportunities; and exporting the production to increase the national income and to enhance the trade sector.
- 7- This industry should have a sufficiently qualified work force to be able to deal with e-commerce; to create new strategies; and to solve problems which might be encountered. This could be achieved through :
  - A- Involving ICT in all education levels and improving education strategies to gain the benefits from all new updates in ICT policies.
  - B- Increasing attention for continuous training in the labour market to raise their efficiency in the field of information and communication technology to work in the area of e-commerce.
  - C- In respect of the business sector, the government needs to spread awareness of the potential benefits; competitive advantage and success which a firm could gain from utilising e-commerce.
- 8- Public and private media (TV; Radio; newspapers, magazines; and conferences) need to participate in increasing the awareness of the importance of e-commerce to the country and to encourage individuals and businesses to understand the e-commerce environment.
- 9- Establishing a legislative environment and developing the legal frameworks which promote confidence in e-commerce by protecting consumers with secure electronic transactions and intellectual property rights.

- 10- Enacting laws and legislations for various aspects of e-commerce to provide elements of security; safety; trust; and protection for customers and dealers.
- 11- Counting on the adoption of e-documents and e-contracts as legal documents and protect them with legal controls. UNCITRAL could be used as a guide in this issue.
- 12- Working on cooperation with other countries, in particular, with those which are Egypt's key partner to in foreign trade, in order to establish joint controls to protect e-commerce between them.
- 13- Encouraging the adoption of e-commerce by reducing customs duties and taxes on transactions conducted through e-commerce and, in particular, associated with export activities; giving business organizations, engaged in e-commerce, some privileges like financial grants and financial facilities with banking system.
- 14- The banking system should provide the necessary loans and funds to support SMEs in adopting e-commerce.
- 15- Financial authorities and the banking system should develop the payment system to be in line with e-commerce requirements and to provide the necessary protection for it.
- 16- Benefiting from international organisations and international companies in the development of security systems and transactions in e-commerce with participation from local IT businesses and the Ministry of Information and Communications.
- 17- Improving the insurance system in covering e-commerce transactions with reasonable prices to encourage SMEs to adopt e-commerce.

## **8.6 Limitations and Suggestion for future Research**

Like any research, this research had a number of limitations which affected some parts of the study and these limitations could be described as follows.

Firstly, as mentioned earlier in chapter four, for comparison purposes, adoption of e-commerce tended to be measured in two different ways: simple adopters; and sophisticated adopters. However all the SMEs, which took part in this research, were considered to be simple e-commerce at the first stage of adoption.

Secondly, there were no official statistics of the number of Egyptian SMEs or, even, the number of businesses utilised e-commerce; consequently, depending on the official statistics, it was very difficult to figure out the sample size.

Thirdly, the sample size was considered to be a limitation since the researcher did his best to reach as many SMEs as possible he can of to take part in this research. However, he received only 130 usable questionnaires with a response rate a 14.4% from the 950 distributed to Egyptian SMEs.

Fourthly, there were many problems which were confronted in collecting the data. These included the duration of the Egyptian revolution which began on 25 January 2011 and lasted for about 6 months thereafter .During this period, firms were closed and there were no commercial activities. Due to the country's troubles and media campaigns giving information about the country's internal situation, the respondents lacked of interest in participating in the research and their attitudes were uncooperative especially since the covering letter to the questionnaire mentioned that the researcher was studying outside the country and the respondents were fearful about answering the questionnaire.

Fifthly, this research study applied to a single country; the data and findings, in the analysis and discussion chapters, expressed only the Egyptian SMEs' environment. This raised a question about the generalisability of the results and whether or not these could be generalised to different countries with different cultures. This might provide some ideas for future research.

In order to explore this area and to develop a comprehensive understanding of this approach, there was a need for a qualitative empirical study and a large quantitative survey. These were required to confirm the validity, of this model, and to investigate any new factors which might arise due to the rapid change in the technology context. Also, issues such as competitive advantage; compatibility; and complexity needed further investigation.

Future qualitative research ought to investigate the relationship between CEO/top management characteristics and the adoption of e-commerce and, in particular, to inspect the impact of lifestyle and organisational factors. A large-scale quantitative survey might discover additional industry differences; for example, those firms, in the tourism sector, where face-to-face customer contact was crucial in maintaining the business's progress. This might extend different experiences with emerging new factors which could impact on the adoption.

There was a need for cross-culture research to replicate this framework and investigate whether or not it would be suitable for other cultures and to explore the similarities and differences in the approaches to the adoption of e-commerce. Also, meta-analytic approaches could be utilised to investigate the drivers and barriers to the SMEs' adoption of e-commerce in comparable regions of the developed world. This would help to understand some potential effects of economic and socio-cultural factors on the relationship with the adoption of e-commerce.

Few researches were conducted in exploring the relinquishment of the adoption of e-commerce and there seemed to be a lack of knowledge and understanding about the environment concerning the relinquishment of e-commerce. In order to explore this area and

to develop a comprehensive understanding of this approach, future research ought to investigate the factors leading to leaving behind the adoption of e-commerce. The triangulation methodology could be applied to this context with a combination of large scale quantitative surveys versus a smaller number of qualitative interviews.

This study was limited to the SMEs sector. With the aim of completing the picture of the adoption of e-commerce, future research ought to be conducted on large businesses. The findings, from large firms, would be functional in affording a comparison, between large and small businesses, of the nature of the adoption of e-commerce. Quantitative and qualitative approaches might be conducted in this context to confirm this study's findings and to understand clearly the differences.

Furthermore, this study was limited to Business-to-Business e-commerce. The developed framework could be used, also, to conduct a relative study in other forms of e-commerce. To be more precise, this is the B2C perspective which, possibly, could deliver useful comparisons on the adoption of e-commerce.

M-commerce has been suggested as a new way out of adopting e-commerce. A future study could explore the opportunities for adopting M-commerce especially in developing countries and particularly in Egypt, especially after the launch of the Egyptian Telecommunications satellites (Nilesat201) in 2010. Meta-analytic approaches could be used to examine, in comparable regions of the developed world, the enablers and inhibitors of IEBT adoption in SMEs.

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## Appendices A: E-commerce Survey

Dear Sir/Madam,

### **The SMEs' Adoption of E-commerce: An Empirical Investigation in Egypt**

I am Mohamed Rabie, a PhD student at the University of Stirling. I am writing to you to request your help in participating in a survey on “**The SMEs' Adoption of E-commerce: An Empirical Investigation in Egypt**”. Your company was nominated to participate in this study. This research's main objective is to improve the effectiveness of E-Commerce and user acceptance in order to increase the volume of electronic trade and to stimulate Egyptian income.

I would like to stress the importance of your collaboration; contribution; and participation in this questionnaire and providing an adequate data for this research to be successful. I should be grateful if you or any of your top management could assist me by spending about 15 minutes to complete the questionnaire. Your co-operation would be greatly appreciated.

**All given information will be treated with strict confidence and will be used only for the research purpose of this study.** If you wish, I should be very happy to forward the results of this study to you.

Thank you for your collaboration and taking the time out of your busy schedule to complete this questionnaire

If you require any clarification, or have any comments or suggestions regarding this study, please do not hesitate to contact me by e-mail: [m.h.rabie@stir.ac.uk](mailto:m.h.rabie@stir.ac.uk). I look forward to receiving your completed questionnaire

Yours sincerely,

**Mohamed Rabie**

**Research Student**

**University of Stirling, UK**

**Faculty of Management**

**Zagazig University, Egypt**

**1- What is your position in the company?**

<input type="checkbox"/>	Chairman of the Board of Directors
<input type="checkbox"/>	Vice-Chairman of the Board of Directors
<input type="checkbox"/>	Director
<input type="checkbox"/>	Marketing Manager
<input type="checkbox"/>	Export/ Import Manager
<input type="checkbox"/>	IT / IS Manager
<input type="checkbox"/>	Other please refer.....

**2- Do you use electronic commerce (e-commerce)?**

Yes       No

**3- What is the nature of the data displayed about your company on the Internet?** (Please tick any which apply)

<input type="checkbox"/>	Basic information (address, Email, fax, telephone number .....
<input type="checkbox"/>	Display products and its information
<input type="checkbox"/>	Placing orders
<input type="checkbox"/>	Full e-commerce web site
<input type="checkbox"/>	Other (please specify).....

**4- How long has your Business been operating?** (Please tick any which apply)

years

**5- What is your company's line of business?** (Please tick any which apply)

<input type="checkbox"/>	Exporting
<input type="checkbox"/>	Importing
<input type="checkbox"/>	Both of them

**6- To what extent, does geographical distance affect your choice of International market?** (Please put circle on your choices)

Not effective at all	Not effective	Neutral	Effective	Very effective
1	2	3	4	5

**7- Under which industry your company can be classified?** (Please tick any which apply)

<input type="checkbox"/>	Textile and apparel
<input type="checkbox"/>	Wood-based products
<input type="checkbox"/>	Electrical and electronic
<input type="checkbox"/>	Food and beverages
<input type="checkbox"/>	Plastic products
<input type="checkbox"/>	Agriculture, Forestry and Fishing
<input type="checkbox"/>	Construction
<input type="checkbox"/>	Miscellaneous

**8- Where are the markets which your company deals with most?**

(Please tick any which apply)

<input type="checkbox"/>	Middle East
<input type="checkbox"/>	China
<input type="checkbox"/>	Europe
<input type="checkbox"/>	USA & Canada
<input type="checkbox"/>	South America
<input type="checkbox"/>	India
<input type="checkbox"/>	Japan
<input type="checkbox"/>	Turkey
<input type="checkbox"/>	South Korea
<input type="checkbox"/>	North Korea
<input type="checkbox"/>	Taiwan
<input type="checkbox"/>	Singapore
<input type="checkbox"/>	Malaysia
<input type="checkbox"/>	Bangladesh
<input type="checkbox"/>	Indonesia
<input type="checkbox"/>	Hong Kong
<input type="checkbox"/>	Thailand
<input type="checkbox"/>	Philippine
<input type="checkbox"/>	Vietnam
<input type="checkbox"/>	Pakistan
<input type="checkbox"/>	Sri lanka
<input type="checkbox"/>	Africa
<input type="checkbox"/>	Australia
<input type="checkbox"/>	Other.....
<input type="checkbox"/>	Other .....

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**9- Which methods do you use to carry out your business in International markets?** (Please tick any which apply)

<input type="checkbox"/>	Advertising/direct sales on the Internet
<input type="checkbox"/>	electronic catalogue
<input type="checkbox"/>	hard paper catalogue
<input type="checkbox"/>	foreign distributors
<input type="checkbox"/>	domestic export agents
<input type="checkbox"/>	overseas import agents
<input type="checkbox"/>	International Trade Point
<input type="checkbox"/>	direct sales/marketing
<input type="checkbox"/>	foreign production
<input type="checkbox"/>	networking/personal contacts
<input type="checkbox"/>	entry in trade directory
<input type="checkbox"/>	foreign retailer
<input type="checkbox"/>	international trade shows/exhibitions
<input type="checkbox"/>	Other (please specify).....
<input type="checkbox"/>	Other (please specify).....

**10- When did you start to use the Ecommerce?**

(Please tick any which apply)

<input type="checkbox"/>	Less than 1 year
<input type="checkbox"/>	1-2 year
<input type="checkbox"/>	2-3 Years
<input type="checkbox"/>	3-4 years
<input type="checkbox"/>	4-5 Years
<input type="checkbox"/>	5-6 Years
<input type="checkbox"/>	6-7 Years
<input type="checkbox"/>	7-8 Years
<input type="checkbox"/>	8-9 Years
<input type="checkbox"/>	9-10 Years
<input type="checkbox"/>	More than 10 years
<input type="checkbox"/>	Other (please specify).....

**11- What is the company's average annual number of deals undertaken through the Internet?**

--

**12- How important are the availability of the following Communication tools on your decisions when deciding whether or not to adopt e-commerce?**

(Please put circle on your choices)

		<b>Very important</b>				<b>not important</b>
Internet		5	4	3	2	1
Trading website where products and services can be ordered		5	4	3	2	1
Word of mouth		5	4	3	2	1
Available Information shopping/Marketing sites		5	4	3	2	1
Email		5	4	3	2	1
Fax		5	4	3	2	1
Electronic Data Interchange		5	4	3	2	1
Network of personal customer						
Other: Please specify		5	4	3	2	1

**13- In which type of Ecommerce do you consider your company belongs?**

(Please tick any which apply)

<input type="checkbox"/>	Business-to-Business (B2B)
<input type="checkbox"/>	Business-to-Consumer (B2C)
<input type="checkbox"/>	Business –to-Government(B2G)
<input type="checkbox"/>	Government–to- Business (G2B)
<input type="checkbox"/>	Government–to-Government (G2G)
<input type="checkbox"/>	Government-to-Consumer(G2C)
<input type="checkbox"/>	Consumer-to-Consumer(C2C)
<input type="checkbox"/>	Consumer –to- Business(C2B)
<input type="checkbox"/>	Other (please specify).....

**14- Here are some benefits your firm should expect from adopting e-commerce. Please indicate the extent to which you agree or disagree with the following statements?** (Please put circle on your choices)

<b>E-commerce :</b>	<b>Strongly agree</b>				<b>Disagree at all</b>
Stimulating our Profits	5	4	3	2	1
Facilitating our financial transactions (paying bills & .....)	5	4	3	2	1
Fostering our customer relations	5	4	3	2	1
Saving our time	5	4	3	2	1
Saving our costs	5	4	3	2	1
Increased our range of markets	5	4	3	2	1
Increased our range of products	5	4	3	2	1
Increased availability of information about goods / services	5	4	3	2	1
Increased our deals	5	4	3	2	1
Easy to start and manage a business	5	4	3	2	1
Increased our firm's ability to compete with other SMEs	5	4	3	2	1
Gave our firm better control over information availability and reliability	4	3	2	1	1
Improved our reliable/accessible ways of storing	5	4	3	2	1
Gave us effective communications with trading partners	5	4	3	2	1
Other: Please specify					

**15- Is your company a member of one of the international trade points?**  
(Please tick any which apply)

<input type="checkbox"/>	Yes (If yes go to Q 19)
<input type="checkbox"/>	No ( If No go to Q 20)

**16- How many transactions did your company carry out through international trade points in 2009?** (Please tick any which apply)

<input type="checkbox"/>	Zero
<input type="checkbox"/>	1-5 transaction

<input type="checkbox"/>	6-10 transaction
<input type="checkbox"/>	11-20 transaction
<input type="checkbox"/>	More than 20 transaction
<input type="checkbox"/>	Other.....

**17- Do you think that doing some business transactions through international trade points will affect the volume of activity of your company in the future?** (Please tick any which apply)

<input type="checkbox"/>	Will not affect at all
<input type="checkbox"/>	Will positively affect slightly
<input type="checkbox"/>	Will positively affect moderately
<input type="checkbox"/>	Will positively affect significantly
<input type="checkbox"/>	Will adversely affect slightly
<input type="checkbox"/>	Will adversely affect moderately
<input type="checkbox"/>	Will adversely affect significantly
<input type="checkbox"/>	Other (please specify).....

**18- Which of the following relationships, do you consider are important to the Long-term success of e-commerce in your business?** (Please put circle on your choices)

	Very important				not important at all
Customer	5	4	3	2	1
Supplier	5	4	3	2	1
Government agency	5	4	3	2	1
Consultants	5	4	3	2	1
Banks	5	4	3	2	1
Business contacts	5	4	3	2	1
Distributors	5	4	3	2	1
Retailers	5	4	3	2	1
Others (please specify) _____	5	4	3	2	1



**22- For the top management supports and attitudes towards using e-commerce in the firm, please indicate the extent to which you agree or disagree with the following statements:**

<b>Management supports</b>	Strongly agree				not agree at all
The top management supports fervently the use of e-commerce.	5	4	3	2	1
The top management allocates the needed resources to develop e-commerce within the company.	5	4	3	2	1
Top management is knowledgeable of the benefits of e-commerce on the firm's performance.	5	4	3	2	1
<b>Perceptions to changes in technology</b>					
Top management is aware that e-commerce will enhance our company.	5	4	3	2	1
Top management is interested to be informed about new e-commerce developments.	5	4	3	2	1
Top management is aware that e-commerce is not inconsistent with our cultural values/habits.	5	4	3	2	1

**23- Please provide your opinions regarding the appropriate level of computer and IT knowledge within your company in order to stimulate e-commerce performance**

<b>Computer and IT knowledge</b>	Strongly agree				not agree at all
Our company employees are knowledgeable with information technology.	5	4	3	2	1
Our company employees are experienced with computer.	5	4	3	2	1
Our company has skilled technical support staff.	5	4	3	2	1

**24- Please provide your opinions regarding the Marketing Capabilities within your company in order to stimulate e-commerce performance**

<b>Marketing Capabilities know-how</b>					
We make a good job of developing new trading services over e-commerce.	5	4	3	2	1
Promotional activities (e.g. advertising) over the Internet gain the firm more market share.	5	4	3	2	1
It enable us to distribute our firm products online as well as offline.	5	4	3	2	1

**25- Below there are a number of statements which illustrate some types of potential government support. To what extent, do you agree with these statements?**

<b>Statements</b>	<b>Strongly agree</b>				<b>not agree at all</b>
The government offers grants/loans to SMEs to encourage the use of e-commerce.	5	4	3	2	1
The government provides workshops / training to SMEs to inform them about the benefits of e-commerce for firms and the economy.	5	4	3	2	1
The government stimulates SMEs to increase their use of e-commerce.	5	4	3	2	1
The government encourages the banking system to offer financial support for SMEs who adopt e-commerce.	5	4	3	2	1
The government has a strong legislative and legal structure to control and regulate e-commerce.	5	4	3	2	1
Information and communication technology at a level that does encourage companies to adopt e-commerce.	5	4	3	2	1
The government has plans and distinctive strategies to increase the SMEs' use of e-commerce.	5	4	3	2	1

**26- Below there are a number of statements which illustrate some types of potential E-readiness features which should be available to stimulate the practice of e-commerce. To what extent, do you agree with these statements?**

Statements	Strongly agree				not agree at all
Internet service providers are easily available.	5	4	3	2	1
Internet downloading/access speed is fast to cope with the global technology.	5	4	3	2	1
E-commerce setting up is at discounted prices.	5	4	3	2	1
Technology equipment's (computers) are at acceptable price levels.	5	4	3	2	1
E-commerce maintenance is available at reasonable costs.	5	4	3	2	1
Security of the online payments process is adequate.	5	4	3	2	1

**27- Will the company adopt a strategy to increase the use of electronic commerce in future?**

<input type="checkbox"/>	Yes (If yes go to Q 27)
<input type="checkbox"/>	No ( If No go to Q 26)

**28- What are the reasons for not having a strategy to increase the use of electronic commerce in the company?**

<input type="checkbox"/>	The expected revenue from e-commerce is not commensurate with the size of investments required by it
<input type="checkbox"/>	Fear of using e-commerce
<input type="checkbox"/>	Lack of expertise to the company's employees
<input type="checkbox"/>	Lack of support and stimulation of the administration
<input type="checkbox"/>	Included in the company's agenda and has not yet begun
<input type="checkbox"/>	High cost on the company's budget
<input type="checkbox"/>	Not in the internal available resources
<input type="checkbox"/>	E-commerce is unrelated to the company's activities
<input type="checkbox"/>	Other (please specify).....

**29- It is accepted that, when starting to deal with international markets, any company will experience some difficulties. Please select from the following list the difficulties which your company might face.**

<input type="checkbox"/>	Barriers and trade barriers (tariffs, regulations etc...)
<input type="checkbox"/>	Insufficient distribution channels
<input type="checkbox"/>	Difficulty in choosing a reliable distributor
<input type="checkbox"/>	Difficulty of matching competitors' prices
<input type="checkbox"/>	Non-availability of adequate support for products
<input type="checkbox"/>	Difficulty of obtaining enough information about foreign markets
<input type="checkbox"/>	Difficulty in communicating with international companies
<input type="checkbox"/>	Unfair competition with foreign companies
<input type="checkbox"/>	Inadequate marketing information on international markets
<input type="checkbox"/>	Inadequate support services for exports
<input type="checkbox"/>	Other difficulties (please specify).....

## **Barriers**

**30- Below there are a number of statements which illustrate some of the e-commerce obstacles. To which extent, do you agree with these statements?**

Statements	Strongly agree				not agree at all
Many trade transactions still require the traditional method of trading.	5	4	3	2	1
Slow completion of commercial transactions because of not using of electronic means in all e-commerce phases.	5	4	3	2	1
E-commerce needs some protocols with special conditions; these are difficult for companies to abide by.	5	4	3	2	1
There is a lack of trust between trading parties.	5	4	3	2	1
There is a lack of racial confidentiality and security through the use of e-commerce.	5	4	3	2	1
The legislative and legal structures are not strong enough to control and regulate e-commerce.	5	4	3	2	1
Information and communication technology is at a level which does not encourage companies to adopt e-commerce.	5	4	3	2	1
The government does not have plans and distinctive strategies to deal with e-commerce.	5	4	3	2	1
The language differences affect the company's decisions in dealing with some foreign companies.	5	4	3	2	1
There is little awareness of programs about e-commerce	5	4	3	2	1

and its importance.					
Local banks do not provide facilities for companies to encourage them to use e-commerce.	5	4	3	2	1
Information technology tools are at a price level which does not help companies to modernize the use of e-commerce	5	4	3	2	1
The company's employees are not trained well enough to deal with e-commerce	5	4	3	2	1
Other: Please specify	5	4	3	2	1

**Demographic Information:**

**For confirmation, this following information will be used only for research purposes**

**31-** How old are you?

..... years
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**32-** What is your gender?

                       
 Male                              Female

**33- Please indicate the highest level of education which you have completed:**

Please indicate the highest level of education completed:

<input type="checkbox"/>	Non educated but can read and write
<input type="checkbox"/>	Primary school or equivalent
<input type="checkbox"/>	High school or equivalent
<input type="checkbox"/>	BSc degree
<input type="checkbox"/>	Master degree
<input type="checkbox"/>	Doctoral degree or higher
<input type="checkbox"/>	Professional degree
<input type="checkbox"/>	Other (please specify) .....

**34- How many people does your business employ?**

--

**35- What is the value of your annual e-commerce sales?**

.....LE
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**36- What is the average of e-commerce sales in relation to the company's total sales?**

..... %

**37- What are your total annual sales?**

..... LE
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**38- What is the capital volume of your firm?**

..... LE
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**39- This data is optional; if you wish to obtain a copy of the findings and recommendations of the study, please provide the following:**

Company's Name: .....  
Address: .....  
Email: .....  
Website: .....

**40- Do you have any other comments?**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**Thank you**

**Mohamed Rabie**