

**E-COMMERCE ADOPTION AMONG SMALL AND MEDIUM  
ENTERPRISES IN SAUDI ARABIA**

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Thesis submitted to the College of Business, Universiti Utara Malaysia in fulfillment of  
the requirement for the Degree of Doctor of Philosophy

## DEDICATION

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## ABSTRACT

The purpose of this study was to determine the relationships between contexts and the e-commerce adoption among SMEs in Saudi Arabia. These contexts included organisational (firm size, attitude, innovativeness, knowledge), technology (relative advantage, compatibility, complexity), and environmental characteristics (competition intensity, information intensity). The study also attempted to determine the moderating effect of culture on these relationships. Rogers's (2003) Diffusion of Innovations Theory and Tornatzky and Fleischer's (1990) method were used as a basis for the framework. In addition, Hofstede's cultural dimensions (power distance, uncertainty avoidance, individualism, and masculinity) were used as moderators.

A quantitative and survey research design was adopted to collect data, test hypotheses, and answer research questions in the study. A total of 1150 questionnaires were sent to SME owner/managers in Saudi Arabia, and 400 were returned, giving a response rate of 34.78 percent.

The results of the study revealed that attitude, firm size, competition intensity, and information intensity had a significant, positive relationship with the e-commerce adoption. However, knowledge and relative advantage had a significant negative relationship with the e-commerce adoption. In addition, the results showed that power distance, uncertainty avoidance, individualism, and masculinity had partially moderating effect on the relationship between organisational context and e-commerce adoption and the relationship between environmental context and e-commerce adoption. Regarding technology context, the result showed that power distance and masculinity had partially moderating effect on e-commerce adoption. On the contrary, the results found that



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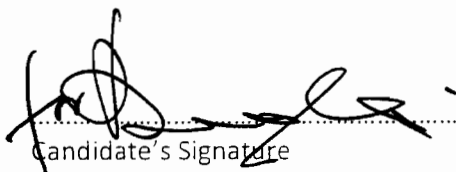
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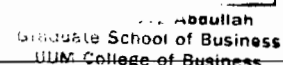
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uncertainty avoidance and individualism had no moderated effects.

This research adds to the existing body of knowledge on e-commerce adoption and discovers additional contexts by offering organisational, technology, and environmental characteristics and the moderating effect of culture on the influence of these contexts regarding the adoption of e-commerce technology among SMEs for more informed decisions. The OTE Model of Innovation Adoption, the DoI theory, and Hofstede's cultural dimensions combined to form a richer theoretical framework that guided the understanding and prediction of e-commerce adoption among SMEs. In addition, this study showed SME owner/managers the opportunities and benefits of e-commerce adoption in a business environment. Furthermore, the results of the study may provide solutions and recommendations for SMEs and governments to successfully implement e-commerce.

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All praise due to the Lord, Allah alone. I praise him, seek his aid and seek his forgiveness. I testify that there is no god but Allah, and that Mohammed (peace be upon him) is his slave and messenger. All grand thanks and praise to Allah for giving me the audacity, endurance, and strength during this long process. It is with Allah's power, blessings, guidance, love, grace, and help that this process has been possible.

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## **CHAPTER ONE: INTRODUCTION**

### **1.0 Introduction**

The rapid advancements and developments in the information and communication technology (ICT) sphere that have taken place, and continue to occur have changed the entire scenario of the way business is done. These accelerations in ICT have transformed the industry structure and taken the competitiveness in the market to a new level. This transformation has no doubt created more opportunities, but it has also posed a threat for small and medium enterprises (SMEs) of being run over by large and high-profile companies and enterprises, as the SMEs still lag far behind in strategy development and implementation (Schlemmer & Webb, 2009). However, the adoption of e-commerce is not a universal solution to the generation of profit opportunities. It is a technology that, with its set of powerful tools which if used with prudence can be a part of any industry's competitive strategy that will enhance and enable it to gain a competitive advantage over its competitors (Egan, Clancy, & O'Toole, 2003; Porter, 2001; Soliman & Janz, 2004; Li, 2008).

The first chapter underlines the background of the study and some characteristics of the country's study, which led the researcher to adopt the current study with a focus on SMEs in Saudi Arabia, followed by the problem statement, objectives of study, significance of study, definitions and concepts, limitations, and scope of study. Finally, the organisation of the remaining chapters describes a summary related to Chapter 2, Chapter 3, Chapter 4, Chapter 5, and Chapter 6.

## **1.1 Background**

Technology has rapidly and radically changed the way various organisations conduct business. For instance, the use of e-commerce opens up the opportunity for firms to reach their customers anytime and anywhere. Indeed, e-commerce is a new method and a better alternative than the old, traditional manner, which is difficult to use when reaching limited customers to increase sales and make marginal gains for the firm (Hooft & Stegwee, 2001; Li, 2008). Moreover, e-commerce is a good method for use between the firm and the customer because it helps in approaching and increasing the mutual confidence between the two when it is used efficiently and effectively (Barry & Milner, 2002).

Previous studies (e.g., Currie, 2002; Zank & Vokurka, 2003; Frohlich, 2002; Hauguel & Jackson, 2001; Eriksson, Hultman, & Naldi, 2008; Kaynak, Tatoglu, & Kula, 2005; Rajabion, 2008; Kojo, Walker, & Hinson, 2008) have reported a number of benefits of the adoption of e-commerce. They include (a) reduced warehousing and inventory, leading to cost savings, (b) the ability to reach global areas that would have been otherwise difficult and time consuming to respond to customers and suppliers, and (c) improved quality of products and services provided by the firms to new markets base on the wishes and requirements of customer.

E-commerce is a quick link between the seller and the buyer, and can be accomplished using modern technology. The seller may be a person or firm, whether public or private; the same may be the case with the buyer. Of course, those considered modern technology include a telephone (both mobile and landline), fax, or the Internet. However, the Internet is the best way to achieve quick and inexpensive communication due to the reduced costs of communication and rapid access while working around the clock (Power & Sohal, 2002; Hutt & Speh, 2001; Zank & Vokurka, 2003).

Recently, those interested in e-commerce have looked to identify different types of e-commerce. For example, Owens and Davies (2001) stated that e-commerce is divided into three types, namely; business-to-business, business-to-customer, and intra-business.

The business-to-business (B2B) type uses ICT to facilitate payment management, inventory management and distribution management. Business-to-business e-commerce concentrates on supply chains and procurement issues (Owens & Davies, 2001). The business-to-customer (B2C) type, on the other hand, deals mainly with the use of e-commerce to enable customer information interaction, personal finance management, purchasing products and the dissemination of after-sales information. The intra-business model is the "use of ICT to share information internally within the business" (Owens & Davies, 2001).

Indeed, the appearance of the Internet in the 1990s spurred rapid growth in using e-business for firms, particularly large organisations, both public or private. This rapid growth corresponded to an online population growth in the world that will reach approximately 1.8 billion by the end of 2010 (Internet World Stats, 2009). This indicator was taken into account by some firms when they adopted e-commerce, especially profitable firms aiming to increase their sales to achieve expansion goals and spread their business around the world. For instance, Amazon.com, eBay, Yahoo!, and Google are good example of such organisations.

This automatic spread of business via the Internet requires cooperation between large enterprises and SMEs in a positive way, especially in transportation and distribution

services (Boyer & Olson, 2002). The use of digital technology with modern information that is renewable efficiently and effectively may assist in continuing the strategic cooperation and alliances between these firms (Andal, Cartwright, & Yip, 2003).

## **1.2 Saudi Arabia: An Interesting Case Study**

Saudi Arabia successfully joined the World Trade Organisation (WTO) in 2005 after years of negotiations. This had a greater openness on the environment of the Saudi economy. In addition, its membership in the WTO has given an opportunity for a concerted effort by the Saudi government and private sector to invest in technology infrastructure. For instance, the Saudi Arabian General Investment Authority (SAGIA), with strong support from senior leadership in the government, successfully attracted and invested in huge projects to establish six economic cities by pumping more than \$60 billion of investment in the geographic locations in the east, west, centre, north and south of the kingdom in the years following 2005. This significant investment provided facilities for SMEs, as well as great opportunities to increase profitability through the cooperation between them and big firms, particularly in support operations and assistance at the local and global levels. This cooperation requires the adoption of modern technological applications in the areas of marketing, particularly with e-

commerce. On the other hand, the neglect of this aspect will be a difficult challenge because of strong competition and the entry of firms with expertise and technology on a larger scale (Idris, 2007; Santarelli & D'Altri, 2003; Soliman & Janz, 2004). Moreover, oil wealth owned by the kingdom of Saudi Arabia has made it to a good ranking among world economies. This feature helped the government to design an attractive economic policy to improve the investment environment in the country and work on infrastructure development.

The report on the world investments released by the United Nations Conference on Trade and Development (UNCTAD) in 2008 considered Saudi Arabia in the first stage in attracting forms of foreign investments in 2007 among Middle East countries. In addition, it took first place at the level of the Middle East and North Africa and ranked 13th out of 183 economies in the world as the best investment environment, according to a report from Doing Business in 2009.

The government views this transformation as a long-term objective, understanding that in keeping with the importance of infrastructure and e-readiness, a broader focus across the country as a whole must first be expanded into e-business areas, such as e-government, e-commerce, and e-learning, both inside and outside of government. E-readiness is defined by the Economist Intelligence Unit (EIU) as "a measure of the

quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit" (EIU, 2008). The opportunity to complete transactions directly may happen by adopting innovative Internet solutions using ICT. The Internet will provide users with data that they need wherever their location without a real cost (Bharadwaj & Soni, 2007; Quayle, 2003; Barnes et al., 2003).

The increase of Internet usage in Saudi Arabia was around 1 million in 2001 and had grown to an estimated 6.4 million by the end of 2007 (See Figure 1.1). This corresponds to a cumulative average growth rate (CAGR) of around 36% annually. However, one of the factors to influence this rapid growth is the privatisation of Saudi Telecom, as well as some other factors such as the increase of shops and maintenance of PCs, laptops, and Internet access, and superior usefulness of the Internet, according to the Saudi Arabia Communications and Information Technology Commission (CITC) first year 2007 report.



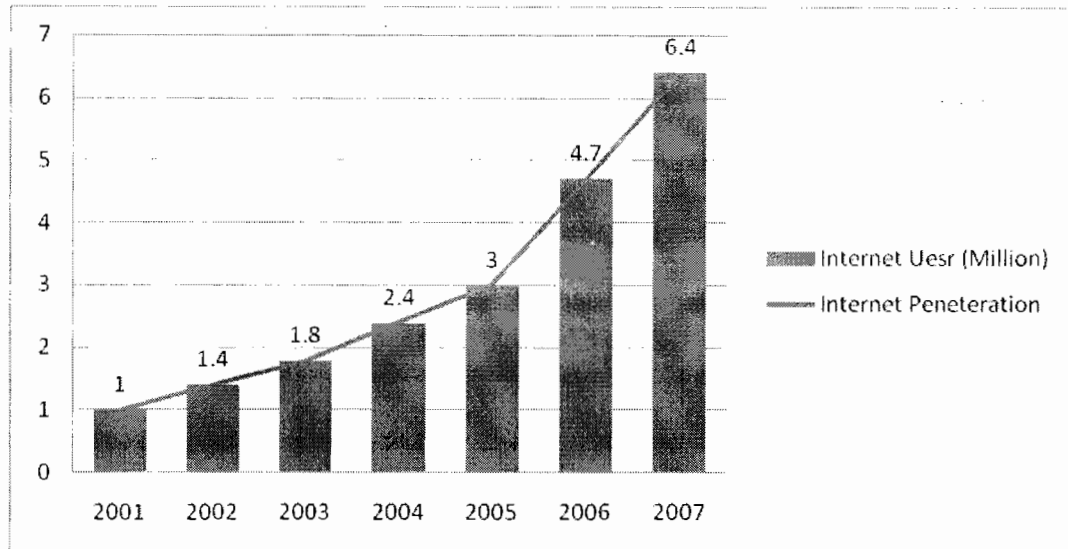


Figure 1.1  
Internet User Growth 2001- 2007 in Saudi Arabia  
Source: Saudi CITC, 2007

However, in terms of e-readiness, Saudi Arabia is still far behind many other developed and developing countries (See Figure 1.2). Although the accumulated scores showed some improvements for four consecutive years, Saudi e-readiness was still ranked 46th out of 70 countries in the world that made it to the report. On the other hand, the United States was ranked first in the latest 2008 report, followed by Hong Kong in second place, Sweden in third, Australia in fourth, and Denmark in fifth place.

2006 E-Readiness Rank (of 68)	2005 Rank	Country	2006 E-Readiness Score (of 10)*	2005 Score
1	1	Denmark	9.00	8.74
2	2	USA	8.88	8.73
3	4	Switzerland	8.81	8.62
4	3	Sweden	8.74	8.64
5	5	UK	8.64	8.54
6	8	Netherlands	8.60	8.28
7	6	Finland	8.55	8.32
8	10	Austria	8.50	8.22

46	46	Saudi Arabia	4.67	4.38
47	44	Thailand	4.63	4.56
48	45	Venezuela	4.47	4.53
49(tie)	50	Peru	4.44	4.07

2008 E-Readiness Rank (of 70)	2007 Rank	Country	2008 E-Readiness Score (of 10)	2007 Score
1	2	USA	8.95	8.85
2	4	Hong Kong	8.91	8.72
3	2	Sweden	8.85	8.85
4	9	Australia	8.83	8.46
5	1	Denmark	8.83	8.88
6	6	Singapore	8.74	8.60
7	8	Netherland	8.74	8.50
8	7	UK	8.68	8.59

46	46	Saudi Arabia	5.23	5.05
47	49	Thailand	5.22	4.91
48	48	Bulgaria	5.19	5.01
49	46	Jamaica	5.17	5.05

Figure 1.2  
E-readiness Rankings, 2005, 2006, 2007, 2008

Source: EIU, 2008

Saudi Arabia is a developing country where ICT adoption has become an important focus, so the contribution of IT to overall economic development can assist to achieve organisational productivity gains. For example, using new technology particularly through e-commerce may assist in reaping benefits and competitive advantage in various firms (e.g., reduced warehousing, cost savings, time saving and improved quality of products and services (Al-Gahtani, 2003; Gibbs, Kraemer, & Dedrick, 2003; Porter, 2001; Doherty & Ellis- Chadwick 2003)).

### **1.3 Small- and Medium-sized Enterprises (SMEs) in Saudi Arabia**

In a review of the literature, SMEs played a very important role in adding real economic value in most nations. Rao, Metts and Monge (2003) stated that SMEs have a greater ability than the large firms in the adoption of administrative services and guidance to new ideas because of their flexibility. In addition, the organisational structure stands in contrast to those of large enterprises, which are governed by internal regulatory procedures between the various levels of management (Kartiwi & MacGregor, 2007). However, the incapability of SMEs to add competitive advantage has faced significant problems in areas such as understanding the market's orientation and business environment both domestically or globally (O'Brien, 1998; Huang & Brown, 1999). For

example, management skills can add competitive advantage for SMEs to market the product with more data and for less cost (Fann & Smeltzer, 1989), but poor management may lose this opportunity in SMEs due to the lack of technology adoption in the marketplace (Freel, 2000). This indicates that the technical and managerial skills possessed by SME owners and management facilities may help greatly in the adoption of new ideas with appropriate financial situations (Bharadway, 2000).

In Saudi Arabia, there is an important role of SMEs that involves a good understanding of the policy of the country to adopt technology in different businesses, particularly after Saudi Arabia joined the WTO, which requires more technical expertise than in the past. Therefore, it is important to study the factors that would be an obstacle facing SMEs in their adoption of technology in general and marketing strategies, such as e-commerce, in particular (Li, 2008).

Ideally, the Chamber of Commerce in Saudi Arabia is a major source to educate SMEs of the importance of their role in the local economy. So, the foremost challenge facing the Saudi economy today is the development of SMEs for their various sectors. This development should be accompanied by technological innovation in line with the current world, despite the differences in cultures. In addition, maintaining these firms in the market is a real opportunity to avoid unemployment in Saudi Arabia; in particular, the

SMEs represent 93 percent of companies in Saudi Arabia (Ismail, 2004). This indicator can be used often to play a significant role, with SMEs holding the ability to reduce the unemployment rate in Saudi Arabia. For example, the diversity of installations in SME business provides an opportunity for suppliers and consumers to sell their products or delivery and the conclusion of the sub-contracts, with particular interest in dealing electronically. The plan would be to use SME facilities to train its staff and then select the Saudis skilled for employment.

However, the issues of SMEs can be resolved if addressed properly. There are difficulties facing SMEs, beginning with the granting of licenses required for the conducting of projects and costs that are mobilised in continuity. Additionally, most of these firms are operating in an environment where internal management is concerned with the lack of necessary data and statistics that can be relied upon in planning for the future (Courtheoux, 2003). Although there are some benefits of e-commerce for SMEs in Saudi Arabia, they are not at the desired level. Therefore, it is very important to study factors that affect e-commerce adoption among SMEs (Lohrke, Franklin, & Lohrke, 2006).

The Ministry of Labour (MOL) in Saudi Arabia must face those challenges and maintain this important development for the economy of SMEs. The role of the MOL would be

the development of such facilities, either to persuade the government to support SMEs and to increase lending by government-owned banks (Bundagji, 2005) or the establishment of an independent general authority to deal with SME facilities with a capital good that can provide suitable loan instalments for those SMEs. Also important for this authority, which is no less significant than support material, is the publication of specialised training centres for the training of managers and owners of SMEs, particularly those who could not continue their studies.

#### **1.4 Problem Statement**

Cultural differences can be related to the territorial boundaries of different nations and this assumption was noted by Kollmann et al. (2009). According to Hasan and Ditsa (1999), for low-context cultures, western IT is specifically designed, which further decompose functions and abstract data and processes. For the high context culture of the Middle East, this is presented in an incompatible manner.

E-business adoption is significantly more influenced by organizational e-readiness than by environmental e-readiness which gets further supported by findings on research focused by South African (Molla and Licker, 2005) and Korean (Jeon et al., 2006). However, a first indication that culture might affect e-business adoption is a tremendous

variation in antecedents. This can be witnessed when comparing results from single country studies on factors affecting e-business (Kollmann et al., 2009).

Results are not clear cut with respect to other factors. In some countries for e.g. in USA and Australia, the e-business adoption decisions are affected by the size of organisation. Meanwhile in other countries for e.g. in Korea, the size of organisation does not matter (Fomin et al., 2005; Jeon et al., 2006; van Beveren and Thomson, 2002). In some countries for e.g. in Brunei Darussalam, competitive pressures are the methods used to push organisations towards adopting e-business where as in countries like Korea, competitive pressure seems to be of minor concern to decision makers (Jeon et al., 2006; Looi, 2005).

To date there has been a lot of empirical work about culture and technology adoption according to Twati (2006). The same has not been seen much in the Arab countries. In addition, the technology developed in the Western countries tend to embody values, attitudes, and beliefs of the West that are different from those of non-Western cultures, such as Arabic culture. There have been few studies that analysed the situation of e-commerce in Arab and identified a number of deterrents to use it for any application (Gefen et al., 2005; Kollmann et al., 2009; Twaijri & Al-Muhaiza, 1996).

Loch et al. (2003) examined the cultural specific inducements and impediments to use the internet in the Arab world. Due to the highly social and family oriented nature of the Arab culture, the findings suggested that culture could be a barrier to internet usage in Arab countries. As the majority of participants expressed that they would feel threatened by how the internet will affect family and community life, they linked this collectivist nature of the Arab world (Hofstede's , 1991) to the limited use of the internet.

There was a qualitative study in the Arab and Middle East countries conducted by Hasan and Ditsa (1999). The representatives of the IT community in the Middle East (Egypt, Jordan and Turkey) were interviewed and they compared their findings with Australia. The study revealed that the high UA of Middle Easterners is the root cause for IT resistance.

Shoib and Jones (2003) described in more depth, the previously mentioned research studies and a number of other similar studies. In the Arab countries, there was a review of 28 empirical research studies presented which described the status of IS. There was significant effect on the perception and attitude of Arabs towards technology due to the effect of culture on the IT adoption in the Arab countries which is also stated in most of the previous work and investigation done. The meaning attributed to technologies varies among people, depending on their socio-cultural attitudes according to Erumban and



Jong, (2006). As such, the perception of the individuals within a society might get influenced in a certain way due to the socio-cultural ambience, perceived values, institutions and political atmosphere which may consequently impact the adoption decisions (Erumban & Jong, 2006).

According to Yasin and Yavas (2007) constraints confronting the expansion of the Internet and its related products and technological environment appear to be multi-faceted and include cultural, economic, technological and legal inhibitors within the Arab countries.

First, for electronic exchange of data and payments, the technological infrastructure is deficient and further cause slow rate of data transfer, continuous disconnections and difficulties in access, which is widely rampant. Second, ownership among the consumers is low for PC's. Third, a credit card-based payment system must be in place for B-2-C transaction to be viable and mostly in Arab culture, cash is a preferred choice of payment vis-a-vis option of credit cards based payment method.

Fourth, in the Arab countries, people favour face-to-face interactions over other modalities of doing business. Fifth, for B-2-C transaction to work, trust must be established among the parties involved along with the technology used which is

established through an elaborate social process and concerns over security and fear of technology exacerbate the situation. Sixth, Basic English familiarity is essential for using Internet and this language barrier coupled with shortage of Arabic software further contributes to the reluctance of consumers using the same.

Seventh, promoting an e-business culture and providing the needed infrastructure and investments is critical and the role of government is very important here (Debreceeny et al., 2002; Wilson, 1999), where most Arab governments have not been very active in promoting e-business. To worsen the matter, by enforcing rigid laws and procedures, Arab government have hindered developments in the private sector. Eighth, the Arabic culture is high on group and family collectivism and power distance, and low on future orientation (Kabasakal & Bodur, 2002; Yasin, 1996) and as such in a high-context culture, content of the communicated message is less important than the personal relationships and context of the communication process. In this milieu, oral communication is preferred over written communication and as such, e-mail or fax-based communication is less preferred over face-to-face communication or even a telephone call. Furthermore, method of delivery is utmost important criterion in comparison to the efficiency in delivering a message specifically because Arab culture being slow-paced, therefore, unlike as in western culture, the instantaneous delivery of a message through electronic means is not valued much.

Ninth, information tends to be controlled and centralized because of the high significance attached to tribal influence in the Arab culture and the central authority figure (i.e. government, top management, and head of the tribe) is the focal point of information, while others are provided information only on a need-to-know basis. Thus, in comparison to the western culture, information technology designed to enhance the dissemination and sharing of information is not valued much in the Arab culture. Tenth, in the Arab culture, buying and selling is a ritual which has a distinct social context and as such, many customers base their purchasing decisions on the recommendations of family members and friends rather than gathering and analyzing information from the Internet. As noted previously, technical difficulties further discourage any inclination towards use of computers and its associated desire to use the Internet for information gathering and analysis. Finally, the need to integrate the supply-chain through B2C practices is minimal because supply-chain in many product/service sectors is relatively short. Thus, face-to-face meetings becomes the preferred mode of conducting B2C transactions is still in its infancy in the Arab business culture.

Khalfan and Alshawaf (2004) also noted that in the Arab regions “there are some barriers to MIS adoption from both cultural/environmental and managerial perspective”. Privacy, security issues, language, communication, and people’s preference for using ‘traditional’ means of doing things are some of the cultural and environmental

perspective barriers included, and in Arab regions, cultural issues and environmental factors are very important and play a major role in adopting MIS.

There is a need to study the e-commerce adoption among SMEs in the Arab countries, particularly in Saudi Arabia. E-commerce enables customers to shop electronically to satisfy their desires and needs locally and internationally with competitive as well as more transparent prices. The same as well may be the case with firms, particularly SMEs, that can offer their products and/or their services to the customers electronically, whether locally or internationally, without the hindrance of taking into account the severity of competition in the market (Pons, Aljifri, & Fourati, 2003; Kaefer & Bendoly, 2003; Porter, 2001). In addition, SMEs are forced today to adopt e-commerce in order to complete their transaction trade efficiently due to the increasing trend towards market competition. Therefore, it has become necessary to study and understand social and cultural contexts that help SMEs to adopt e-commerce to deal with such competition (Hubona, Truex, Wang, & Straub, 2006; Lohrke et al., 2006).

In the context of Saudi Arabia, a survey on the use of the Internet by Saudi companies revealed that 67 percent did not have Web access, 57 percent did not use the Internet at all, and only 10 percent of the Saudi-based companies have a Web presence (King Abdul Aziz City of Science and Technology (KACST), 2006). In addition, the main

reasons cited by the study of non-users of the Internet in business and, in particular, the private sector is that 89 percent did not believe that there is a need for the use of the Internet in their work, and this proportion is increasing more among SMEs (CITC, 2007). Therefore, one of the strategic bases that was adopted by the national policy for science and technology was the care, support, and encouragement of national human capacity of creativity and innovation through a policy of encouraging the establishment of SMEs via the adoption of technical, economic incubators. Hence, efficiently adopting technology for a firm has become a significant strategy. To accelerate the adoption of technology, particularly with e-commerce, which has become an important factor in the marketing strategy of organisations, decision-makers in developing countries, particularly owners of SMEs in Saudi Arabia, are searching for answers about the important questions related to the factors that would influence the SMEs to adopt e-commerce.

Several studies (Mirchandani & Motwani, 2001; Sathye & Beal, 2001; Lertwongsatien & Wongpinunwatana, 2003; Scupola, 2003; Seyal & Rahman, 2003; Chang-Shuo, 2006; Al-Qirim, 2006; Li, 2008, Alzougool & Kurnia, 2008) have noted social factors that influence SMEs to adopt e-commerce. Examples of these factors are organisational characteristics, environmental characteristics, technological characteristics, managerial

time, relative advantage of e-commerce, IT knowledge, organisational size, CEOs' attitudes, CEOs' innovativeness, and e-commerce compatibility.

Twati (2006) mentioned that adopting technology will occasionally work in opposition to the organisation's needs, in a different cultural context. In addition, he stated that in Arab regions, in comparison to western culture, the characteristics, government, and lifestyles are different which may not help the adoption of technology in the Arab regions.

Grandon and Pearson (2004), for instance, in the Chilean case were able to show that decision makers in SMEs provided with the necessary financial and technological resources to implement such technologies, were especially willing to adopt e-business hinting the importance of organisational readiness.

Tornatzky and Fleischer's (1990) Organisation, Technological and Environment (OTE) Model, which is rooted in the specific organisational, technological, and environmental contexts of a firm or an organisation, was founded as a model that has been widely used in various studies on adoption processes of e-commerce by SMEs. Based on the key concepts of the OTE model (Tornatzky & Fleischer, 1990), the contextual factors that influence organisational innovation adoption are considered a prorate study (Thong,

1999). The three aspects of a firm's context that influence technological innovation are classified clearly by the framework. First, an individual's approach to technology may help to improve ICT use in his/her SME (Poon & Swatman, 1997). In addition, it may move them to form a positive or negative attitude about adopting e-commerce, based on personal perceptions of innovation and attributes, which in turn can influence his/her decision to adopt or reject technology (Rogers, 2003). In the same context, behavioural theories have been applied to examine the process of information technology adoption, some of which are the Diffusion of Innovation Theory (DoI), Theory of Reason Action (TRA), Theory of Planned Behaviour (TPB), and Technology Acceptance Model (TAM).

Ideally, the DoI model's process examines the personal decisions of the adopter regarding a new idea. In this model, there are three receiver variables, which are personality characteristics (e.g., general attitude toward change), social characteristics (e.g., cosmopolitanism relationships), and perceptions of the attributes of an innovation that affect its rate of adoption, which are relative advantage, compatibility, complexity, trialability, and observability. (More discussion about the DoI model appeared in Chapter 2).

These variables are also consistent with the OTE model. For instance, personality characteristics (e.g., general attitude toward change) can match the organisation's or firm's characteristics in the OTE model. In addition, social characteristics can be met via the environment characteristics in the OTE model. And finally, the five perceptions of the attributes of an innovation that affect its rate of adoption can be met with the technology characteristics of the firm in the OTE model (Tornatzky & Klein, 1982). Tornatzky and Klein (1982) also conducted a study entitled *Innovation Characteristics and Innovation Adoption Implementation: A Meta-Analysis of Findings*. They indicated that three attributes from Rogers' five attributes, namely; relative advantage, complexity, and compatibility had the most consistent adoption decisions. In addition, Sait, Al-Tawil, and Hussain (2004) stated that trialability and observability cannot be used in Saudi Arabia, as e-commerce has not been used satisfactorily, so respondents will not be able to comment from the reality of the experience.

On the other hand, the study of SMEs and their e-commerce adoption has become a recent trend. Many countries are experiencing growth with respect to the usage of e-commerce and taking into account that culture is an important issue due to its effect on the acceptance or rejection of a new technology (Siddiqui, 2008; Yoon, 2009; Li et al., 2009; Kollmann, Kuckertz, & Breugst, 2009). In addition, the technological culture in SMEs and their success in managing their business and marketing their products



effectively opens the way for adoption and use of e-commerce to fulfil the desires and needs of their customers and gain a competitive advantage in the various local markets effectively (Pavic et al., 2007).

In the same context, the modern business environment that relies on e-commerce in offering and marketing products and/or services electronically needs harmonisation between this offering to customers and the marketing strategy of the firm. For example, the firm that is looking forward to increasing sales through electronic strategy of expansion is required to have improvement in its technological culture to present its products and/or services in accordance with the wishes and aspirations of its customers, especially those who are outside its geographical domain and have their own culture. To improve the technological culture of the firm, particularly for SMEs, it is important to study the direction and view of these firms to adopt this new technology and realise the factors that play an influential role in the adoption and application.

According to Hofstede's typology, Saudi Arabia (which is an Arab country) was classified as having high power distance, uncertainty avoidance, and masculinity, and having low individualism (Buragga, 2001). However, this study states these dimensions of culture would differ among Saudi SME owners. In the following, the study specified Hofstede's dimensions of culture as moderators due to their empirical support and

acceptance among academic researchers to business studies and technology adoption (Twati & Gammack, 2006). In addition, Marino, Strandholm, Steensma, and Weaver, (2002) in their studies on SMEs in Finland, Greece, Indonesia, Mexico, the Netherlands, and Sweden, mentioned the effect of culture and pointed to it as an important issue for SME firms because of competition and challenges in the external environment in the current business world of entrepreneurship. Also, they described the importance of the need for researchers to study the effect of moderators in cultural and social contexts in their studies because of the different degrees of innovation and the level of culture in business entrepreneurship, especially in SMEs. For example, firms with individualistic, masculine cultures may be different from firms with different collective, feminine cultures due to their views about technology innovation and proactive adoption. Moreover, Siddiqui (2008) used culture as a moderating variable in her study due to its profound effect on adopting or rejecting technology based on people's intentions. According to Morris et al. (2005), the effect of moderators plays a large role. It is believed that the cultural factors of power distance, uncertainty avoidance, individualism/ collectivism, and masculinity/femininity are moderated by individual psychological dimensions and, thus, effect SME owner's intentions to adopt e-commerce.

In this study, the OTE model is extended by adding the cultural values of power distance, uncertainty avoidance, individualism, and masculinity as moderating variables to the set of organisational context, technology context, and environmental context affecting e-commerce adoption among SMEs. The research framework draws heavily on the DoI theory and the OTE model. This study focuses on SMEs for two main reasons. First, the SME sector owns a high proportion of firms in each country where this ratio in general 90 percent (Alzougool & Kurnia, 2008). In particular, in developing countries it ranges between 60 percent and 70 percent (United Nations Conference, 2002). This indication explains the importance of this sector in the economy of those countries. Second, the flexible and limited work environment in this sector helps in accepting and adapting with the new technology in a way faster than the large enterprises sector, which works in a more routine and bureaucratic environment (United Nations Conference, 2002; Rao, Metts, & Monge, 2003).

On the other hand, the first reason is considered an opportunity and positive aspect to distinguish the external environment for the sector of SMEs and the second reason is considered a strong point in the internal environment of this sector, through which it can create an added value in its business operations and improve its financial position by adopting and using e-commerce in their works. Finally, there are still some lingering questions regarding the adoption of e-commerce by SMEs in Saudi Arabia, and the

analysis of the appropriateness of the theories applied in this study could help this important sector that represents a large proportion of the Saudi market.

In the literature, there has hardly been any attention received towards this issue. According to Johnson and Lenartowicz (1998), the studies show the impact of culture, in the context of economic growth in general. Due to lack of attention received towards this issue (Erumban & Jong, 2006), the research that investigates the relationship between cultural factors and the influence on OTE adoption decisions among SMEs in Saudi Arabia will further enrich our understanding of technology adoption in general and e-commerce adoption in particular. Thus, the need for research on Saudis' perceptions of e-commerce is essential and timely. Within this culture, such research can lay the foundations for future model testing and will also help to guide the design of e-commerce applications and its associated use.

### **1.5 Objectives of Study**

This research will identify the determinant context for applying and expanding e-commerce in Saudi Arabian SMEs and methods to help the SMEs of these determinant contexts, as well as help to set the requirements to initiate an e-commerce system and show the anticipated benefits of e-commerce to an enterprise. This research eventually

will provide solutions for developing successful e-commerce; the goal will be to inspire Saudi Arabia SMEs to adopt e-commerce technology in their transactions. This study will focus on the current business environment, addressing the major determinant contexts that Saudi Arabia SMEs encounter and where the introduction of e-commerce could bring substantial value. Specific objectives in this study are:

1. To prove and support the model being adopted as the basic conceptual framework (OTE Model by Tornatzky and Fleisher 1990) which in turn allows for the testing of the moderating factor of culture.
  - i. To prove the significant relationships between the organisational context and the e-commerce adoption among SMEs in Saudi Arabia.
    - a. To test for the significant relationship between firm size and the e-commerce adoption,
    - b. To test for the significant relationship between owner's knowledge and the e-commerce adoption,
    - c. To test for the significant relationship between owner's attitude and the e-commerce adoption, and
    - d. To test for the significant relationship between owner's innovativeness and the e-commerce adoption.

- ii. To prove the significant relationships between technology context and the e-commerce adoption among SMEs in Saudi Arabia.
    - a. To test for the significant relationship between relative advantage and the e-commerce adoption,
    - b. To test for the significant relationship between compatibility and the e-commerce adoption, and
    - c. To test for the significant relationship between complexity and the e-commerce adoption.
  - iii. To prove the significant relationships between environmental context and the e-commerce adoption among SMEs in Saudi Arabia.
    - a. To test for the significant relationship between information intensity and the e-commerce adoption, and
    - b. To test for the significant relationship between competition intensity and the e-commerce adoption.
2. To examine the moderating effects of culture dimensions on the relationship between *organisational context* and the e-commerce adoption among SMEs in Saudi Arabia.

- i. To determine for the moderating effect of power distance on the relationship between *organisational context* and the e-commerce adoption,
  - ii. To determine for the moderating effect of uncertainty avoidance on the relationship between *organisational context* and the e-commerce adoption,
  - iii. To determine for the moderating effect of individualism/collectivism on the relationship between *organisational context* and the e-commerce adoption, and
  - iv. To determine for the moderating effect of masculinity/femininity on the relationship between *organisational context* and the e-commerce adoption.
3. To examine the moderating effects of culture dimensions on the relationship between *technology context* and the e-commerce adoption among SMEs in Saudi Arabia.
  - i. To determine for the moderating effect of power distance on the relationship between *technology context* and the e-commerce adoption,
  - ii. To determine for the moderating effect of uncertainty avoidance on the relationship between *technology context* and the e-commerce adoption,

- iii. To determine for the moderating effect of individualism/collectivism on the relationship between *technology context* and the e-commerce adoption, and
  - iv. To determine for the moderating effect of masculinity/femininity on the relationship between *technology context* and the e-commerce adoption.
4. To examine the moderating effects of culture dimensions on the relationship between *environment context* and the e-commerce adoption among SMEs in Saudi Arabia.
- i. To determine for the moderating effect of power distance on the relationship between *environment context* and the e-commerce adoption,
  - ii. To determine for the moderating effect of uncertainty avoidance on the relationship between *environment context* and the e-commerce adoption,
  - iii. To determine for the moderating effect of individualism/collectivism on the relationship between *environment context* and the e-commerce adoption, and
  - iv. To determine for the moderating effect of masculinity/femininity on the relationship between *environment context* and the e-commerce adoption.



To provide further clarification to the above objectives, the following research questions are presented in the form of summary. These research questions indicate the need to further understand the effect of organisational, technology and environment on e-commerce adoption and the need to examine culture as the moderate effect.

1. Are there significant relationships between organisational context and the e-commerce adoption among SMEs in Saudi Arabia?
2. Are there significant relationships between technology context and the e-commerce adoption among SMEs in Saudi Arabia?
3. Are there significant relationships between environmental context and the e-commerce adoption among SMEs in Saudi Arabia?
4. Do culture dimensions moderate the relationship between organisational context and the e-commerce adoption among SMEs in Saudi Arabia?
5. Do culture dimensions moderate the relationship between technology context and the e-commerce adoption among SMEs in Saudi Arabia?
6. Do culture dimensions moderate the relationship between environmental context and the e-commerce adoption among SMEs in Saudi Arabia?

## **1.6 Significance of Study**

This research key contribution is among SME's, look at the possible relationship between cultural affects and OTE through its influence on e-commerce adoption. It further explores the idea that a certain amount of the variability of e-commerce can be explained by differences in culture (Klein & Waxin, 2009). It is the intent of this research to examine the extent of features associated with Arab culture, and the kingdom of Saudi Arabia shaping features of owners firm's culture, given that Arab cultures have distinct characteristics.

This research may be of potential value to both theory and adoption of e-commerce among firms. It examined fundamental contexts in firms, such as organisational, technology, and environmental contexts, and the moderating effect of culture on the influence of these contexts regarding the adoption of e-commerce technology among SMEs. Despite calls in the literature, unfortunately, no study has yet investigated the potential moderating effects of culture on the influence of organisational, technology, and environmental contexts on e-commerce adoption among SMEs. This study attempts to fill the aforementioned gaps in the literature. Further, since the majority of existing studies have concentrated on the firm sector, this study extends the existing research on

organisational, technology, environmental, and cultural dimensions including power distance, uncertainty avoidance, and masculinity to firms – namely, SMEs.

This study also may provide basic data for future studies and stimulate further research on how to advance organisational, technology and environmental contexts in developing countries. Finally, this study may also be of value to multinational organisations that have to deal with different cultures, particularly the economies of countries that have become interdependent on each other after agreements with the WTO.

In addition, this study will show the opportunities and benefits of e-commerce adoption in a business environment. These advantages may lead to clearer pictures for SME owners for adopting e-commerce strategies to remain in the realm of competition. Furthermore, the results of the study may provide solutions and recommendations for SMEs and governments to successfully implement e-commerce in the Arab countries in general and Saudi Arabia in particular.

### **1.7 Definitions and Concepts**

***Innovation adoption.*** Rogers (1995) defined innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption”. Recently, Linder et

al. (2003) defined innovation as “implementing new ideas that create value”. In the case of e-commerce adoption, practice and implementing this idea may assist to create value to SME such as new investment in different locations (Franquesa & Brandyberry, 2009).

*Attributes of innovations.* Rogers (2003) identified five attributes of innovations affecting the rate of diffusion of a technology. Following are the theoretical definitions of Rogers' five attributes:

- a. Relative advantage: “the degree to which an innovation is perceived as being better than the idea it supersedes”.
- b. Compatibility: “the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters”.
- c. Complexity: “the degree to which an innovation is perceived as relatively difficult to understand and use”.
- d. Trialability: “the degree to which an innovation may be experimented within a limited basis”.
- e. Observability: “the degree to which the results of an innovation are visible to others”.

*Electronic commerce (e-commerce).* Atrostic et al. (2000) defined e-commerce as “any transaction completed over a computer-mediated network that transfers ownership of, or rights to use, goods or services”. Recently, Bharadwaj and Soni (2007) stated that “e-commerce may include several business activities such as selling, buying, and advertising products and services over the Internet. It also includes sharing data electronically, providing customer services, conducting financial transactions, Internet research, and related business activities”.

In this study, the e-commerce adoption focuses on the customer interface. According to Wu, Mahajan, and Balasubramanian (2003), there are two divides of e-commerce in (B2C). They are outbound communication and order taking.

Outbound communication can be with customers, suppliers, or partners online, while order taking can be with customers to facilitate transactions for them, such as ordering and paying online. In this study, business-to-customer (B2C) e-commerce determined the adoption of e-commerce among SMEs in Saudi Arabia. Hence, business-to-customer (B2C) e-commerce activities will be determined. Business-to-business (B2B), government-to-business (G2B), customer-to-customer (C2C), or other e-commerce businesses will be excluded.

**Culture.** Culture is defined as standards of behaviour and shared values among a group of people (Kotter, 1996). The best known conceptualisation of national culture is that of Hofstede (1980, 1991, 2001). Black (2001) indicated that the work of Hofstede aimed to identify and explain the differences in the patterns of the relevant work based on the four basic dimensions of culture as:

- a. Power distance (the degree to which inequality among individuals is considered a way of life).
- b. Uncertainty avoidance (the degree to which individuals lack tolerance for ambiguous situations and need for formal rules).
- c. Individualism/collectivism (the degree to which people hold concerns for themselves as individuals rather than for the priorities and rules of the group to which they belong).
- d. Masculinity/femininity (the degree to which individuals emphasise work goals and assertiveness rather than personal goals and nurturing).

Dorfman and Howell (1988) measured Hofstede's four dimensions of cultural context as follows:

- Power distance: Agree would be high power distance.
- Uncertainty avoidance; Agree is high UA; disagree is low UA.
- Individualism/collectivism: Agree is collectivist; disagree is individualistic.
- Masculinity/femininity: Agree is masculine; disagree is feminine

### **1.8 Limitations and Scope of Study**

The population of the research was small and medium-sized enterprises (SMEs) located in Riyadh, eastern Saudi Arabia, and Mecca (Saudi Arabia), irrespective of whether they are using e-commerce applications or not. Small and medium enterprises are as follows: Small enterprises employ fewer than 50 employees, while a medium enterprise is one that employs fewer than 250 employees (OECD, 2005). According to Al-Ghalayini, Saudi Arabian SMEs account for 88% of economic ventures in the country and of the total registered enterprises in the kingdom, 81% are small-scale projects, while 7% are medium enterprises (Ramadan, 2002).

Previous studies stated that the organisational structure of SMEs is less complex and that the decision has been made mainly by the owner (Bunker & MacGregor, 2000; Hill & Stewart, 2000; Denise & Standing, 2005). Thus, the participants will be defined as owners for the purpose of this study. Hence, the owner's perception of innovation adoption can lead to determining his intention to implement innovation (Rogers, 2003).

## **1.9 The Organisation of the Remaining Chapters**

The remaining chapters are organised into five chapters as described below. Chapter 2 is divided into five sections. The first section is devoted to reviewing Internet history and use in the kingdom of Saudi Arabia. In addition, this section includes subheading, such as the future of the Internet and the importance of e-commerce in Saudi Arabia and the historical perspectives of Internet use by SMEs in Saudi Arabia. Also, the current developments at Saudi SMEs, Saudi Arabia's Internet-related policy framework, SMEs' Internet-based strategy, and the strategic focus of Saudi Arabia's SMEs' Internet use are described. The second section is devoted to SMEs adopting an e-commerce overview with a focus on SMEs studies. The third section is devoted to Tornatzky and Fleischer's (1990) model and literature studies that have adopted the model. The fourth section is devoted to theories related to innovation adoption, such as the Theory of Reasoned Action, the Diffusion of Innovation Theory, the Theory of Planned Behaviour, and the Technology Acceptance Model. The last section is devoted to defining culture and literature related to the effect of culture.

Chapter 3 describes the hypotheses and theoretical development that built the proposed research model and hypothesised relationships. Chapter 4 describes the methodology, including the design of the research and the strategy and method of research. There are



three sections in this chapter, which include the sampling procedure, validity and reliability, and data collection. Chapter 5 describes the results of the data analysis and explains the proper analysis test related to the research hypotheses.

The last chapter, Chapter 6, describes the discussion and conclusion of the study, including the summarisation of the study findings followed by the study's hypotheses. In addition, implications of the study from both theoretical and practical perspectives are explained in detail. Finally, the limitations and recommendations for future research and the overall conclusions are discussed.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

The second chapter of this research paper begins with an overview of Internet history and use in the kingdom of Saudi Arabia. Then, the chapter mainly focuses on the historical perspectives of Internet used by SMEs in Saudi Arabia. The chapter delves into the current developments at Saudi SMEs. A detailed evaluation has been made in regard to Saudi Arabia's Internet-related policy framework and SMEs' Internet-based strategy, as well as the present status of Internet usage in Saudi Arabia in respect to the different sectors. Accordingly, illustrative details of the national policies that have been developed to exemplify the required support from the government of Saudi Arabia to facilitate the adoption of technology in the country, namely e-commerce, have also been covered.

The second part of this chapter discusses SMEs adopting e-commerce and opportunities and competitive advantages attached to e-commerce, as well as integral factors, such as organisational, environmental, technological, and cultural factors that come into play in the adoption and diffusion of an innovation. Theories related to innovation adoption,

such as the Theory of Reasoned Action, the Diffusion of Innovation Theory, the Theory of Planned Behaviour, and the Technology Acceptance Model are described. Finally, the culture effect and related studies are explained

## **2.1 Internet History and Use in the Kingdom Of Saudi Arabia**

### **2.1.1 Introduction**

The use of the Internet in the kingdom of Saudi Arabia was officially made available only in 1997. The current level of its use in Saudi Arabia is considerably higher in almost every sphere of commercial and non-commercial activity (Al-Tawil, 2001). The Internet in Saudi Arabia was actually used back in 1993 in the eastern Saudi Arabian province of Dhahran at one of the largest and most advanced institutions – the King Fahad University. The Internet was established through a basic direct connection with a company in the United States of America. At that time, only the e-mail facility was provided to the university's student community, but at a much reduced speed of connection. By 1995, it became difficult for the line to carry a greater load. Thus, it was switched over to Riyadh at the King Abdul Aziz City of Science and Technology for the use of a higher load. This was accomplished by having a direct connection with King Faisal Specialist Hospital, which was directly connected to the U.S. via Baltimore's

Johns Hopkins Hospital. By 1998, the Saudi Telecom Company took over to provide Internet service directly to King Abdul Aziz City of Science and Technology (KACST) (Al-Tawil, 2001).

Currently, the KACST provides some governmental organisations, companies, and institutions with Internet connectivity. However, since 1994 KACST was established as the domain manager to coordinate Internet services nationwide in the kingdom. This paved the way for the public to benefit with access to the Internet. However, the first official approval for nationwide use of the Internet came in 1997. Thus, the year 1997 has been taken for any historically significant analysis of the subject in Saudi Arabia. The subsequent years after 1994 to 1997 were marked by a hectic pace of ICT policy development and the creation of watchdog institutions. The national security perspective received much greater attention from the government of Saudi Arabia at that time because the Internet was thought to be a far-reaching influence on the average citizen and the firm (Kalathil & Boas, 2003; Carter & Belanger, 2005; Valentino et al., 2008; Al-maghrabi & Dennis, 2010).

In 1997 the Council of Ministers, a comparable body of policy makers to a Cabinet of Ministers elsewhere, approved the full implementation of a national ICT policy with emphasis on the use of the Internet. The subsequent licensing procedures were well

articulated to prevent Internet service providers (ISPs) from resorting to bad practices. The involvement of the Saudi Telecom Company (STC) and the KACST in providing the essential mentoring and services to the service providers went on to augment the whole process (Al-Tawil, 2001; El-Omari & Martin, 2010).

In Saudi Arabia, the CITC is responsible for implementation of the ICT policy. It has great significance in spreading the Internet and ICT infrastructures appropriately to create the optimum environment for use in Saudi Arabia. The ICT policy has given a great chance to thousands of Internet users since 1997 up until now. On the other hand, Internet usage had been slow from some sectors (Al-Tawil, 2001). The CITC is both an ICT policy-making body and a regulator in Saudi Arabia, while many other government agencies and departments are involved in the national ICT design, planning, and implementation process in varying degrees. However, the first phase of Internet use and policy design from 1997 to around 2005 was marked by a much greater lackadaisical pace. In the first instance of all the cities, only Riyadh was doing marvellously well. Indeed, gradually other cities were drawn into the fold. The second phase of implementation actually began during the post-2005 period, though yet again this division was based on a historically convenient perception of Saudi Arabia's ICT policy evolution and not on any deliberate policy or strategy implementation process of the Saudi government (U.S.-Saudi Arabian Business Council, 2005).

### **2.1.2 The future of the Internet and the importance of e-commerce in Saudi Arabia**

Internet usage in Saudi Arabia is expected to continue to grow. In addition to the structure of the new Internet, which would reduce the price of Internet use, other factors would promote the growth of Internet usage in Saudi Arabia. One of the most important causes of growth was the younger demographics in Saudi Arabia, as that segment of the population can deal with modern technology faster than expected (Al- Subaihi, 2008; Al-Shohaib et al., 2010; Emdad et al., 2009).

According to the report from Internet World Stats, the number of Internet users in Saudi Arabia is estimated to be the second largest among Middle East Internet usage and the largest among Arab countries with a percentage growth of 3,781 percent during the period from 2000 to 2009 (Internet World Stats, 2009). The growth of Internet usage in all Arab countries will make it possible to increase the amount of Arabic content on the Internet, which will be a factor for attracting more Saudis to the use of e-commerce, which in turn would positively influence the economic prosperity and high value of e-commerce in Saudi Arabia (Al-Subaihi, 2008).

In the same context, an extensive survey and study conducted by the Arab Advisors Group for Internet users in Saudi Arabia (2008) investigated the widespread use of e-

commerce and found that users of e-commerce in Saudi Arabia totalled more than 3.5 million users, or 14.26 percent of the population with a value of \$3.28 billion. The study showed that the steady increase in the number of Internet users and the growing population base was excellent for a big e-commerce market in Saudi Arabia, where the results of this research confirmed the fact, indicating significant opportunities for e-commerce growth. The study also indicated that 42.2 percent of e-commerce users in Saudi Arabia were using credit cards for purchases.

The Ministry of Commerce and Industry in the Saudi government has initiated a proposal for the formation of a permanent technical committee for e-commerce based on the importance of optimal investment in technology and accelerating the completion of related requirements. In addition, the committee pointed out a number of tasks that should be taken into consideration in order to develop and promote e-commerce, as follows:

- 1- Follow-up developments in the field of e-commerce and take the necessary steps to keep pace with these developments and take advantage of global experiences in this area.
- 2- Identification of needs and requirements for the use of e-commerce techniques and applications in Saudi Arabia to serve the interests of the national economy,

and coordination with the concerned authorities in this regard, taking steps to expedite the process required.

- 3- Follow-up until completion of the work required of each hand, as well as preparation of periodic reports on the progress of work on a regular basis.

### **2.1.3 The historical perspectives on Internet use by SMEs in Saudi Arabia.**

Internet usage in Saudi Arabia has acquired a major element in the management efforts of SMEs in their transaction trade. According to Alrawi and Sabry (2009), the Internet is an important communication tool for firms, especially SMEs. For instance, the internal and external communication of firms in their local or global transactions can be seen with regard to their strategy applications of ICT. The changing ICT environment of firms has such a big impact on the trade transaction of firms' related decision-making process, especially working with multinational companies (MNCs). Therefore, the Internet as a connection channel played a vital role in this change (Arenius, Sasi & Gabrielsson, 2005; Jeremy & Philip, 2006; Yoo, 2010; Bly, 2010; O'Rourke, 2010; Legge, 2010; Haroon & Zia, 2010).

Although the MNCs have created ICT as the main deal-related strategic policy choice, smaller firms like SMEs in Saudi Arabia have used it much less (CITC, 2007). However,



while the former had been able to increase their net investment expenditure on ICT on a larger scale, the latter have also been able to increase ICT-related investments on a smaller scale. As a result, a clearer dichotomy between the two entities can be noticed. Saudi Arabia has adopted communication policy measures with the intention of changing the environment with a strategic shift in the ICT policy. Thus, the historical note of SMEs in particular and other Internet users in general have been greatly influenced by this change due to the competitive environment in the business strategy (Simon & Corrales, 2002; Reijonen & Komppula, 2010; Wei, 2010; Sirec & Mocnik, 2010; Banham, 2010).

On the other hand, private business firms in Saudi Arabia widely use the English language in their ICT-related activities, while the use of Arabic on the Internet is widely prevalent among government departments and agencies, especially education, health, and social services. According to recent research, on average SMEs spend \$153 and \$410, respectively, per month on the purchase of computer hardware and related services. The historical perspective on the use of the Internet shows that in the beginning, Saudis, both firms and individual citizens, were much less inclined to use the Internet. In fact, in the first few months, the prevalence rate of Internet users was even below 1 percent (Al-Shohaib, Al-Kandari, & Abdulrahim, 2009).

The Mission Statement of the Commission is to “Ensure the provision of universally available, high quality, and affordable communication and information technology services” (CITC, 2008). According to available data, almost 70 percent of Saudis and 64 percent of the expatriate population in Saudi Arabia used Arabic as their operating language. This wide prevalence rate of the Arabic language for operating purposes is attributed to the fact that both individual citizens and government departments tend to carry out communication by using Arabic rather than English with the hope that it would facilitate easy conveyance of ideas. Thus, this paper would investigate e-commerce as a new business strategy of SMEs and the impact of the factors that could have influence on the adoption of this strategy.

#### **2.1.4 The current developments at Saudi SMEs**

The growth of the Internet has helped the prevalence rate to increase much faster than was initially planned for. The overall outcome of the government-level implementation of ICT initiatives at the institutional level in Saudi Arabia indicate a higher level of Internet use at education universities and colleges (CITC, 2007). However, the socio-economic class differences also have played a significant role in determining the level of Internet use. According to researchers, Saudi society can be divided into many layers depending on wealth and income. The upper middle class and the middle class have

been very conscious about upward social mobility by way of extensive use of the ICT. This, in turn, has influenced the SMEs to adopt a very well-calculated approach to doing business on the net (CITC, 2008).

Recently, CITC analysed the results of previous studies in the years 2007 and 2008 for the firm's sector in the kingdom of Saudi Arabia. The results indicated that the rate of growth of the computer in small enterprises was moving slowly at just 3 percent. In addition, Internet usage between firms is still relatively low. Moreover, e-commerce among SMEs has increased slightly. The same study indicated that one of the reasons for this is due to a lack of training facilities and not understanding the importance of using the Internet and the benefits of e-commerce. These reasons were cited by previous studies as well (e.g., Helen & Brigid, 2002; Kaynak et al., 2005; Kartiwi & MacGregor, 2007; Eikebrokk & Olsen, 2009; Hsiu, 2008; Chong et al., 2009; Kevin & Brian, 2007; Eugene, Pak & Sid, 2004).

The SME sector in Saudi Arabia needs to integrate organisational goals with the ICT policy to be appropriate with a structural change of ICT policy. For instance, SMEs in Saudi Arabia have been influenced by the changing commercial environment due to the strategy of e-commerce that has been used from firms' competition. Therefore, environmental factors such as competition would have an impact on a firm's strategic

intents (Amoako-Gyampah, 2003; Jeen, Bin & Guan, 2010; Henry, & Temtime 2010). However, the firm's strategic intents and identification opportunities may assist the management in designing and planning ICT programs in more advanced technology adoption.

ICT-related benefits have come to be identified with positive organisational outcomes as well (Amoako-Gyampah, 2003; Stockdale & Standing, 2004). According to recent World Bank reports regarding firms that engaged in international business operations, nine out of 10 of these firms have allocated a greater proportion of resource investment in ICT. This is because there is a qualitative shift in their operational environment (Zeng et al., 2008).

Many firms have been forced to develop an ICT policy. The current economic downturn has affected things as well, in the form of falling demand for many business firms. According to the Saudi Business Establishment second year 2008 report, already there were signs of falling ICT-related investments in overseas operations of firms, though so far no full-fledged study has been undertaken regarding a comprehensive assessment of the impact of the economic downturn. These developments have affected Internet use by SMEs in Saudi Arabia as well (CITC, 2008).

ICT strategy requires defined organisational goals that are appropriate for the firm. Organisational goals vary between firms, depending on the nature of each firm (Zeng et al., 2008; Noudoostbeni et al., 2010; Ndubisi, 2010). For example, service firms have a set of opportunities, while manufacturing firms are faced with a set of options for alternative strategy policy. The organisational outcomes and/or goals in the business operations of Saudi firms are related to the environment and the level of the ICT influence in harmonizing an activity, while market-based operations essentially influence the organisation's communication strategy to such an extent beyond the domestic level. In Saudi Arabia, recent changes in the sphere of Internet use and its impact on SMEs have been noticed to produce a very positive effect for the firm policy on ICT.

#### **2.1.5 Saudi Arabia's Internet-related policy framework and SMEs' Internet-based strategy**

E-commerce activities of SMEs are determined by the extent to which they use the Internet to coordinate their international and interregional operations. The cost constraint aside, there are other bottlenecks in adopting a domestic Internet policy or strategy. The strategic operational environment of SMEs, unlike those of the MNCs, is increasingly being characterised by the changing behaviour of Saudi consumers. Therefore, the real

impact of Internet-related strategies can be seen in the firm's ability or inability to achieve Internet-related positive synergies in its international and domestic operations (Khan, 2002; Rmesh et al., 2010; Angelo & Stefano, 2010; Rock, Hira & Loibl, 2010; Rhee, 2010; Patel & Cardon, 2010; Ang, 2008; Weiting, 2008; Commander & Svejnar, 2011; Rondeau, Ragu & Vonderembse, 2010). Even those firms that exclusively operate within the national borders would be compelled to adopt a broader Internet strategy in order to make use of Internet-related benefits. The ever-increasing intensity of domestic and international strategies and Internet-related policy shifts have invariably produced a process of global integration, niche market-centric differentiation, and innovative communication strategy (Stockdale & Standing, 2004). The centre of this galaxy of activity in the Saudi business environment is the SMEs.

The existing parameters of Internet growth in Saudi Arabia have been focused on establishing a framework of reference between and among the most significant endogenous and exogenous variables that underlie the operations of SMEs that, in turn, seek to coordinate their international and domestic efforts through ICT-related strategies. SMEs in Saudi Arabia have been particularly known to have preferred Internet-related policies based on both market expansion and competitive reorientation. In order to identify and address the causal factors of Internet integration strategy of Saudi's SMEs into their overall business strategy, it is essential to focus attention on the Saudi

government's attitude towards this technology (Looney, 2004; Gani, & Jermias, 2009; Korkmaz, & Messner, 2008; Cross et al., 2010). Thus, it is essential to investigate the impact of the Internet on the Saudi society from the viewpoint of the firm and the government, in addition to society at large.

In order to understand the outcomes related to ICT policy initiatives of Saudi firms and the extent of Internet use, it is essential to have a proper understanding of the average SME's knowledge about and ability to control competitors' marketing prowess well in advance, so that the strategic planning would not be upset and potential online customers would be more sure of the transaction and its outcome. These strategic and cost-related issues have become the common problem of many companies seeking to target potential buyers online, especially on social networking sites (Looney, 2004; Kranz & Santalo, 2010; Zach & Zhu, 2010; Iuliana, Sorin & Razvan, 2008;). Thus, they would have to adopt a very efficient viral marketing effort that doesn't go against spamming rules and would essentially generate sales per cent spent on its design, planning, and implementation (Kaynak et al., 2005; Hontou, Diakoulaki & Papagiannakis 2007; Xuan, Atkins & Yong, 2009; Herrmann, 2009).

#### **2.1.6 Strategic focus on Saudi Arabia's SMEs' Internet use**

The application of identifying differences of environment in local businesses is connected with the overall global business strategy of the firm (Linden, 2003). The Internet is a single aspect of this global strategy within e-commerce. If the firm was unable to identify and isolate the important elements in the global operational environment, there would be much less of an opportunity for the firm to successfully integrate into the global and domestic market environments. In other words, the strategic environment of competition and regulations would impact the local product differentiation efforts of the firm to a greater extent (Oxley & Yeung, 2001; Mahrokian et al., 2010; Yang, Yiyun & Zafar, 2007; Kumar & Wellbrock, 2009).

The integration of ICT-related outcomes into the overall corporate strategy of the SME in Saudi Arabia would have a definite impact on the operations of the firm. On the other hand, a service organisation would have much less trouble in increasing its strategic presence in the market because much of its operations depend on the ability to market the product by using better communication and coordination (Chu & Smithson, 2007; Fabian, Molina, & Labianca, 2009). For example, good customer relations would enable the firm to reach the customer at the right time in the right place. Saudi SMEs have to focus on the Internet with these issues on mind. However, it must be noted that recent



developments both in Saudi Arabia and the world have forced SMEs in Saudi Arabia to adopt a very cautious approach to initiating ICT strategies at the organisational level.

Despite these constraints, including the cost factor, Saudi-based SMEs have been increasingly adopting Internet-based marketing strategies. Thus e-commerce strategies adopted by SMEs in Saudi Arabia have invariably led to the current debate on the level of progress and available choices for domestic and overseas market expansion of SMEs via e-commerce activity. The overall success of these SMEs in strategically reorienting their competition policy based on the use of the Internet is very significant in Saudi Arabia (Malla, 2003; Maghrabi, Jefery & Bin, 2009; Al-maghrabi & Dennis, 2010; El-Omari & Martin, 2010).

The government of Saudi Arabia has initiated the essential policy framework for a nationally comprehensive ICT and/or e-commerce strategy that SMEs and other big companies have made use of to adopt sound ICT strategies, including expansion programs on the Internet. These initiatives have enabled SMEs to achieve some corporate goals with remarkable success (Soliman & Janz, 2004; Jeen et al., 2010; Sirec, & Mocnik, 2010; Reijonen & Komppula, 2010), though there is much more to be accomplished in the future.

## **2.2 SMEs Adopting E-commerce Overview**

E-commerce involves the trade of goods and services in an electronic manner, such as by computer-based transactions for businesses that utilise Internet networking systems as well as several technologies that are digital in nature (Lauden & Laudén, 2000). E-commerce has made a great convergence between the markets of the world's economy, in addition to providing the consumer freedom of choice between these markets, which in turn led to competition among enterprises and the discovery of new ways of innovation (Kaynak, Tatoglu, & Kula, 2005).

According to the study by Mulpuru, Johnson, McGowan, and Wright (2008), online retail sales transactions will grow from \$175 billion in 2007 to \$335 billion by 2012 in U.S. In addition, Mulpuru et al. (2008) mentioned that online shoppers via the Internet and e-commerce were the reason for the shifting sales from stores in the U.S. For the Arab countries, including Kuwait, Lebanon, Saudi Arabia, and UAE, the amount of B2C transactions was estimated at \$4.87 billion in 2007 (Arab Advisors Group, 2008). In addition, the Arab Advisors Group found that B2C users in Saudi Arabia spent more than \$3.28 billion in 2007.

Business is facing an exponential growth in sales and purchases electronically, whether locally or regionally or internationally due to the spread of Internet service at the state level (Gibbs et al., 2003; Rayport & Jaworski, 2004; Barua, Konana, Whinston, & Yin, 2001; Rayport, Jaworski & Kyung, 2005). According to Li (2008), e-commerce is the most important marketing strategy and through it, firms can improve their relationship with suppliers and consumers. In addition, neglect of this strategy is a major challenge for firms, especially SMEs when facing market competition (Kaefer & Bendoly, 2003; Santarelli & D'Altri, 2003; Rayport & Jaworski, 2004; Rayport, et al., 2005). Moreover, studies have argued that e-commerce is a major factor in the openness to foreign markets and to continue in competition (Porter, 2001; Barnes et al., 2003; Soliman & Janz, 2004).

SMEs have great importance in the economies of many countries, in addition to solving the problem of unemployment (Hall, 2002). According to Kartiwi and MacGregor (2007), the opening up of SMEs on international markets by adopting and using e-commerce is one of the appropriate solutions to increase their contribution rate in gross domestic product (GDP).

Table 2.1

SME Business Opportunities and Customer Benefits Of E-commerce

SME business opportunity	Customer benefit
Global presence	Global choice
Improved competitiveness	Quality of service
Mass customisation and customerisation	Personalised products and service
Shorten or eradicate supply chains	Rapid response to need
Substantial cost saving	Substantial cost saving
Novel business opportunities	New products and services

*Source: Helen & Milner, 2002*

Table 2.1 shows some positive opportunities that can be obtained by SMEs through the adoption of e-commerce, which would make clear to decision makers in those firms that neglecting this aspect of their marketing strategies would put them outside the scope of the competition. On the other hand, the using of e-commerce gives customers some benefits and advantages that would reinforce the confidence and persistence in using of e-commerce. Previous studies in Table 2.2 that focused on SMEs and the necessity of adoption and use of information technology to develop their businesses, particularly in e-commerce, pointed out the important role that can be added by this technology either on the private partial economy in this sector or the whole economy of the country. This important role needs to train and support SMEs from the governments' side to use technology and adopt it in their business to preserve it, especially at the present time, which is witnessing intensive competition in the markets.

According to Tambunan (2005), SMEs have been neglected in the previous literature regarding technology study. This tendency was the opposite of studies focused on examining the technology identified in large enterprises. Despite the importance of large enterprises in each country, this does not make SMEs any less important for researchers when the comparison is made between the proportion of SMEs to large enterprises in each country.

There are few studies related to the barriers that limit the growth of e-commerce in Arab countries. For instance, Aladwani (2003) carried out a study on Arab countries regarding e-commerce issues. The findings of the study showed that 80 percent of the respondents surveyed have intentions to do e-shopping in the near future, 67 percent looked at e-shopping as an easy way to use/carry out tasks, and 65 percent were fully satisfied to use the Internet in their shopping. In addition, Mallah (2003) investigated barriers to e-commerce adoption among SMEs in Saudi Arabia. The factors included were “technical barriers, financial barriers, organisational barriers, behavioural barriers, and legal barriers”. In general, most of the barriers were seen as true barriers.

The benefit of previous serious studies on the SMEs and what related to adopting the technology in their works, in particular e-commerce, would be possible to light the way for this sector in Saudi Arabia and help it greatly to overcome the factors that could

delay the application of e-commerce in its work. The next section will address how some studies have focused on e-commerce by SMEs.

Table 2.2  
Some Selected Studies Focusing on SMEs

Reference	Explanatory variables
Al-Qirim (2006)	Relative advantage, compatibility, complexity, top management support, organisational readiness, size, cost/financial and technical resources, information intensity and product characteristics, managerial time, industry pressure, competition, government pressure, consumer readiness, support from technology vendors
Mirchandani and Motwani (2001)	Top management support, relative perceived advantage of e-commerce, employees' IT knowledge, e-commerce compatibility with the work of the company
Scupola (2003)	Innovation champion, employees' IS knowledge, competitive pressure, customer/supplier pressure, government, quality of access to e-commerce-related services, e-commerce barriers, e-commerce benefits, e-commerce-related technologies
Chang-Shuo (2006)	Organisational size, CEOs' attitudes, CEOs' innovativeness, relative advantage, compatibility and complexity, information intensity and competition intensity
Kaynak, Tatoglu, and Kula (2005)	Market development, efficiency of sales and promotion, ease of accessibility and cost reduction
Sarkar (2009)	User involvement, customer interaction, top management support, CEO's knowledge, external pressure, competition in industry, external support and technical compatibility, IS expertise, IS security, cost benefit and perceived advantage
Nasco et al. (2008)	Attitude, subjective norm and perceived behavioural control, intention to use
Marino et al. (2002)	Entrepreneurial orientation, strategic alliance portfolio, extensiveness, national culture
Li (2008)	Expertise, resources slack and risk propensity, perceived competitive pressure, perceived ease of use and perceived relative advantage, behavioural intention toward online direct sales channel
Alzougool and Kurnia (2008)	Perception of technology, perceived organisation resources, perceived governance and perceived management support, perceived trading partners' readiness and perceived level of trust among industry players, perceived government support and

	perceived supporting services, perceived internal pressure and perceived external pressure
Franquesa and Brandyberry (2009)	Owner's characteristics and firm's characteristics, environmental factors and financial slack
Tan, Chong, Lin and Eze (2009)	Relative advantage, compatibility, trialability, observability, complexity, security/confidentiality, ICT cost, benefits and barriers

### 2.3 Tornatzky and Fleischer OTE Model

It is ideal to have a basis in research, and a theoretical model plays an important role in the process. Scupola (2009) mentioned that many studies have been used Tornatzky and Fleischer's (1990) OTE Model to investigate factors affecting e-commerce adoption among SMEs. Thus, the review of literature had suggested that the OTE structure integrates an appropriate function upon studying context-based factors that influence electronic business ways (Tornatzky & Fleischer, 1990). One ideal framework identifies an aspect that astounds the innovative technology stance, as it results in an e-commerce assimilation of propensity as well as usage of innovation as rooted in the specific, firm-based context.

Several literatures (e.g., Scupola, 2003; Scupola, 2009; Grover & Goslar, 1993; Al-Qirim, 2006; Lertwongsatien & Wongpinunwatana, 2003; Chang-Shuo, 2006; Kuan & Chau, 2001; Sophonthummapharn, 2008; Chau & Tam, 1997; Thong, 1999) have

suggested that technology-identified OTE models have the ideal structure appropriate for the research and study of factors that are known for e-business success. According to Tornatzky and Fleischer (1990), “the OTE framework identifies three aspects of a firm's context that influence its assimilation of technological innovation” (p. 152).

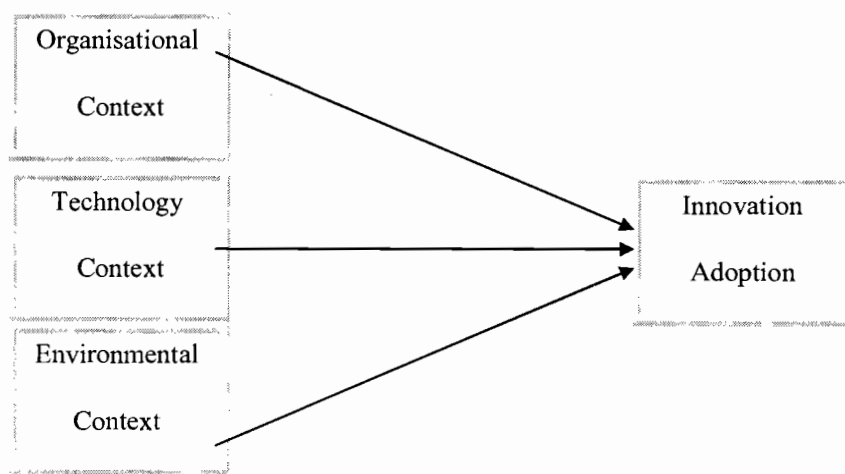


Figure 2.1  
Theoretical Framework Based on OTE Model  
*Source: Tornatzky & Fleischer, 1990*

### 2.3.1 Organisational context

According to Tornatzky and Fleischer's (1990) definition mentioned above, organisational context contains all domestic issues that could affect the firm's innovation adoption in terms of organisational and managerial skills. A number of studies have investigated factors of organisational context in various IT fields. For example, Grover



and Goslar (1993) examined organisational context in a study related to telecommunications technologies adoption, which included three factors: organisational size, centralisation, and formalisation. Other researchers (Chau & Tam, 1997; Lertwongsatien & Wongpinunwatana, 2003; Al-Qirim, 2006) also examined organisational context in studies related to technologies adoption, including complexity of IT infrastructure, satisfaction with existing systems, formalisation of system development, management size, top management support for e-commerce, existence of an IT department and technical resources, information intensity and product characteristics, and managerial time.

Organisational context factors related to e-commerce adoption among SMEs were also found in other studies (Thong, 1999; Lertwongsatien & Wongpinunwatana, 2003; Chang-Shuo, 2006), including organisational size, CEOs' attitudes, CEOs' innovativeness, and CEOs' knowledge. There is a lack of empirical evidence that addresses the moderate link between organisational context relationships and e-commerce adoption among SMEs, such as a cultural context. Therefore, the present study added a new context named *culture* and placed this context between the organisational context and e-commerce adoption. The definition of this construct is based on the works of the Hofstede model (2001).

### 2.3.2 Technology context

According to Tornatzky and Fleischer's (1990) definition mentioned above, a technology context contains all issues related to technology, whether inside or outside of the company, that could help with innovation adoption in line with their capabilities. A number of studies have investigated factors of technology context in various IT fields. For example, Grover and Goslar (1993) examined technology context in a study related to telecommunications technologies adoption, including IS maturity. Other researchers (Chau & Tam, 1997; Lertwongsatien & Wongpinunwatana, 2003; Al-Qirim, 2006) also examined a technology context in studies related to technology adoption, including perceived benefits, perceived barriers, perceived importance of compliance to standards, interoperability, interconnectivity, relative advantage, compatibility, and complexity.

Technology context factors related to e-commerce adoption among SMEs were also found in other studies (Thong, 1999; Lertwongsatien & Wongpinunwatana, 2003; Chang-Shuo, 2006), including relative advantage of IS, compatibility of IS, and complexity of IS. However, there is a lack of empirical evidence that addresses the moderate link between technology context relationships and e-commerce adoption among SMEs, such as a cultural context. Therefore, the present study added a new context named *culture* and placed this context between the technology context and e-

commerce adoption. The definition of this construct is based on the works of the Hofstede model (2001). Diffusion of the innovation model has shown social system variables, including social system norms.

According to Hofstede (1991, 2001), social norms change from one country to another or from one firm to another based on the varying culture. He stated his original concept consists of distinct cultural dimensions that researchers can draw upon to describe a particular national culture. (See Figure 2.2).

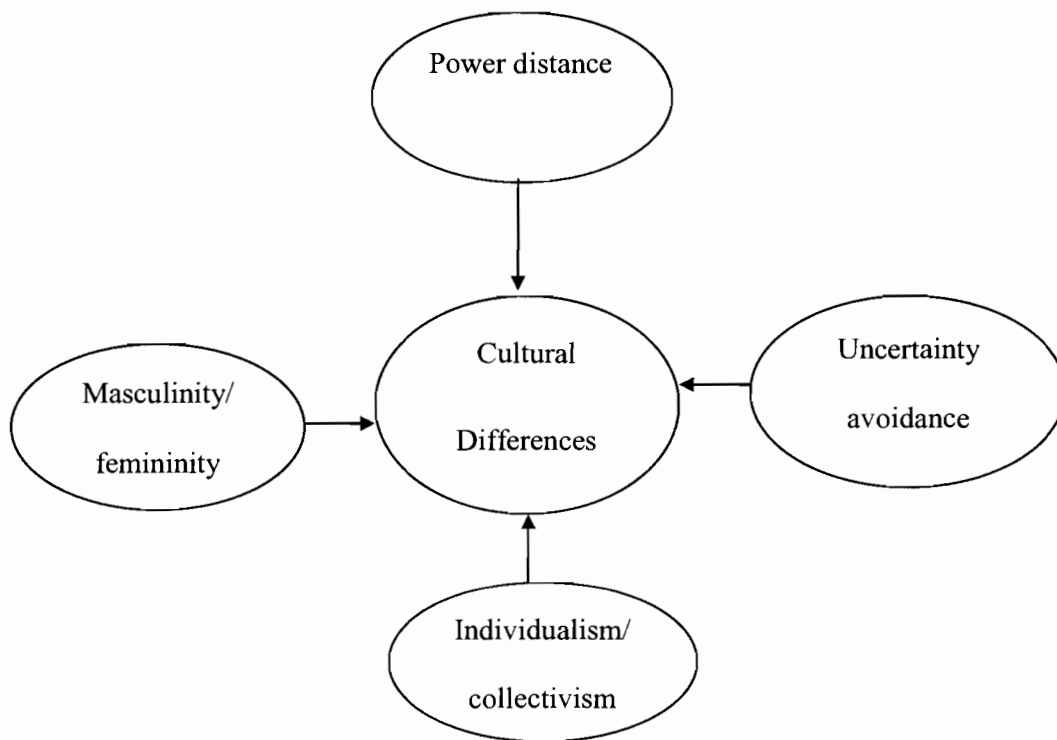


Figure 2.2  
Hofstede's (1980) Model of Cultural Differences

In the current study, Hofstede's model is used. It has been instrumental in the implementation of many business systems and academics studies (Zakour, 2004). Moreover, it has shown that culture has a major effect on individual differences (Hofstede, 1980, 1991, 2001; Thatcher, Srite, & Stepina, 2003).

### **2.3.3 Environmental context**

According to Tornatzky and Fleischer's (1990) definition mentioned above, an environmental context contains all issues related to the firm's business within the sector that belongs to them and with external parties, such as customers, suppliers, and the government. A number of studies have investigated factors of environmental context on various IT fields. For example, Grover and Goslar (1993) examined environmental context in a study related to telecommunications technologies adoption, including environmental uncertainty.

Other researchers (Chau & Tam, 1997; Lertwongsatien & Wongpinunwatana, 2003; Al-Qirim, 2006) also examined environmental context in studies related to technologies adoption, including competition, information intensity, competitiveness and industry pressure, government pressure, consumer readiness, and support from technology vendors.

Environmental context factors related to e-commerce adoption among SMEs were also found in other studies (Thong, 1999; Lertwongsatien & Wongpinunwatana, 2003; Chang-Shuo, 2006), including competition intensity and information intensity. However, there is a lack of empirical evidence that addresses the moderate link between environmental context relationships and e-commerce adoption among SMEs, such as a cultural context. Therefore, the present study added a new context named *culture* and placed this context between the environmental context and e-commerce adoption. The definition of this construct is based on the works of the Hofstede model (2001).

Many have studied the technological innovative process, as the OTE model links to a stable research theory centred along with application dominance to other information systems in the e-commerce domain, confirming that innovative processes bring about strong technology. Thus, the clear assumption of benefits given technology-based software leads to a crisis attributable to the undisciplined application of technology principles (McClure, 1997).

The OTE model has been investigated by a number of research studies in various IT fields. For example, Thong (1999) developed perceptions based on organisational, technology and environmental frameworks, incorporating three factors as e-commerce adoption predictors. Moreover, he confirmed that the study of the adoption of

technology innovations by the OTE framework is comprehensive to e-commerce innovative domain. Therefore, technological innovation is considered the primary factor of B2C development in SMEs (Jeon, Han, & Lee, 2006).

## **2.4 Theories/Models Related to Innovation Adoption**

Innovation diffusion is defined as “adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organisation” (Damanpour, 1991, p. 556). Different attitudes of adoption for firm members on the basis of this definition have led most researchers to study the appropriate theories that can lead to the interpretation of this difference, especially in technology adoption. For example, companies or firms have more complex innovation adoption levels than individuals due to the diversity of business (Rogers, 1995). In addition, different countries' cultures have led researchers to study the factors influencing the innovation adoption of technology in order to understand the beliefs and intentions of individuals and firms in accepting the technology and comparing it between cultures. Therefore, there was a need for models and theories to help in the study of these phenomena well.

Previous studies have indicated some of those theories that would help in discovering the factors that affect technology adoption (e.g., Theory of Reasoned Action (TRA), the Diffusion of Innovation (DOI) Theory, the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM)). The following section will focus on these theories that have contributed in this area.

#### **2.4.1 Theory of Reasoned Action (TRA)**

According to Ajzen and Fishbein (1980), there is a possibility to verify the individual's intention and direction to take specific action by using the Theory of Reasoned Action (TRA), as shown in Figure 2.2. The final results of this phase can be studied by knowing the intention of the individual under consideration. This concept led Ajzen and Fishbein to determine the factors that may affect the attitude of the individual. Additionally, Harrison et al. (1997) noted that whenever there are benefits from the adoption and implementation of e-commerce, the individual's attitude was positive towards the use of e-commerce. Moreover, Ajzen and Fishbein took into account that environmental surroundings can affect the individual's decision and intention. Therefore, they added the factors that can have influence by external parties. Thus, Parker and Castleman (2007) stated that external parties are an important factor in supporting the attitude of decision makers to adopt technology in the SME context.

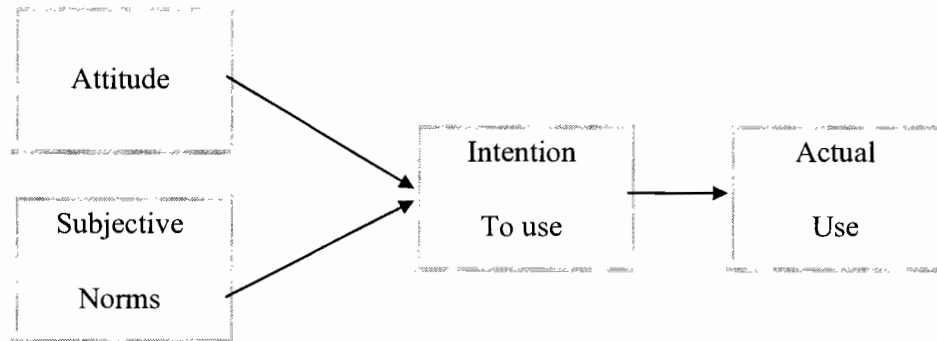


Figure 2.3  
The Theory of Reasoned Action  
Source: Ajzen and Fishbein, 1980

A number of previous studies adopted the TRA to determine the intention and attitude of the individual to adopt the technology in general and e-commerce in particular (e.g., Zhang & Fjermestad, 2008; Wu & Liu, 2007; Hartwick & Barki, 1994; Davis, Ajzen, Saunders, & Williams, 2002; Brewer, Blake, Rankin, & Douglas, 1999; Lee, Tsai, & Jih, 2006; Pak, 2000; Song & Kim, 2006; Wooley & Eining, 2006; Davis, Bagozzi, & Warshaw, 1989; Mahmood, Bagchi, & Ford, 2004; Yoh, Damhorst, Sapp, & Laczniak, 2003). In 1985, Ajzen extended the TRA into the Theory of Planned Behaviour.



#### 2.4.2 Theory of Planned Behaviour (TPB)

Ajzen (1985) found that the TRA, which included attitudes and subjective norms, needed other constructs to be more specific and to understand the intention and behaviour of the individual. Therefore, he added the construct of perceived behavioural control as shown in Figure 2.3. According to Ajzen (1991), the argument of this construct is due to the different attitude of individual behaviour between the easy and difficult to perform by other controls.

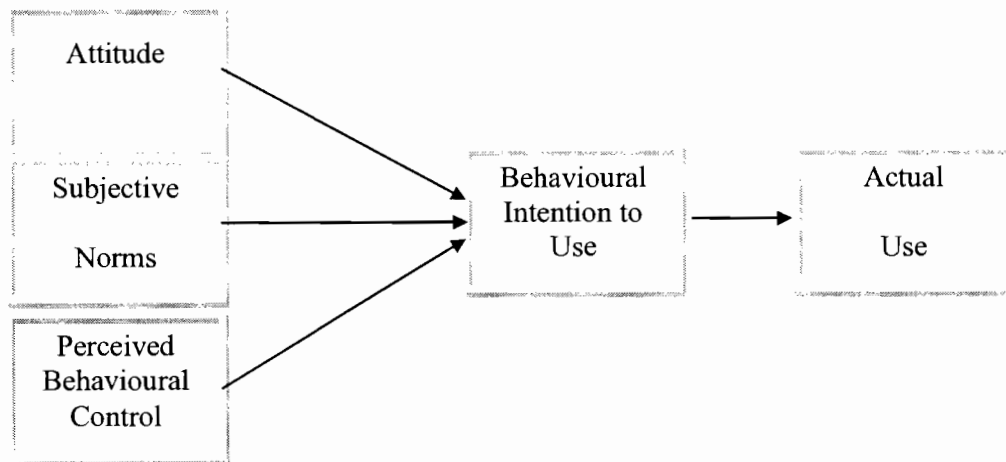


Figure 2.4  
The Theory of Planned Behaviour  
Source: Ajzen, 1985

A number of previous studies have adopted the TPB to determine the intention and attitude of the individual to adopt technology and e-commerce (e.g., Taylor & Todd, 1995; Dawkins & Frass, 2005; Pavlou & Fygenson, 2006; Grandon & Mykytyn, 2004; Harrison et al., 1997; Kula & Tatoglu, 2003; Riemenschneider & McKinney, 2001; Hrubes, Ajzen, & Daigle, 2001; Shim et al., 2001; Nasco et al., 2008).

In the SME context, Nasco et al. (2008) studied e-commerce adoption in Chile. He found the constructs of the TPB (attitudes and subjective norms) in direct measure to strongly support e-commerce adoption among SMEs in Chile, while the construct of perceived behavioural control was not supported. On the other hand, in the case of indirect measures, all three constructs of the TPB were supported.

In addition, Grandon and Mykytyn (2004) studied the intention to use e-commerce adoption among SMEs and found the TPB was a useful guideline to study social factors and attributes in technology adoption. Moreover, Dawkins and Frass (2005) stated that the TPB can be studied to predict behaviour and how it will affect decision makers in small businesses.

### 2.4.3 Technology Acceptance Model (TAM)

Davis (1989) found that the TPB based on the TRA needed other constructs to be more specific and to understand the intention and behaviour of an individual's technology acceptance. Therefore, he added the construct of perceived ease of use and perceived usefulness as shown in the Technology Acceptance Model (TAM) in Figure 2.4. According to Davis (1989), the argument of this construct is due to the difference of products and services that can be easy or difficult to access by technology usage. Due to the importance of subjective norms, which were main constructs in the TPB and the TRA, Venkatesh and Davis (2000) added subjective norms to the TAM, which is known as TAM 2.

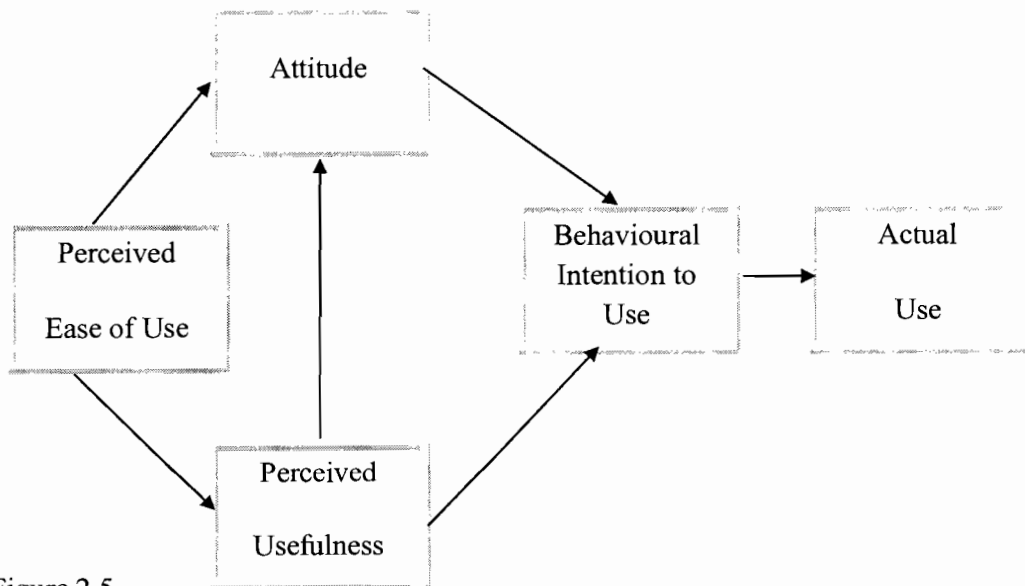


Figure 2.5

The Technology Acceptance Model

Source: Davis, 1989

A number of previous studies have adopted both the TAM and TAM 2 to determine the intention and attitude of the individual to adopt technology and e-commerce (e.g., Olson & Boyer, 2003; Riemenschneider et al., 2003; Grandon & Pearson, 2004; Jantan et al., 2001; Kohn & Husig, 2006; Lin & Wu, 2004; Poon & Swatman, 1999; Wymer & Regan, 2005; Awa, Nwibere, & Inyang, 2010; Bagozzi, 2007; Al-Gahtani, 2008; Lee et al., 2003).

In the Arabic context, Al-Gahtani (2008) extended the TAM, including three moderating factors (gender, age and educational level) to investigate the applicability of the TAM model. He stated that the TAM was compatible with the working technology environment in Saudi Arabia; in addition, the TAM gave a good prediction for measuring the use of technology and adoption.

In the SME context, Lin and Wu (2004) studied the end user's computing acceptance among Taiwan's SMEs. They found the end user's computing acceptance was influenced by management support. In addition, perceived usefulness was directly affected by perceived ease. Similarly, Kaynak et al. (2005) tested what factors can influence e-commerce adoption among Turkey's SMEs. The results showed perceived benefits as the most important factor influencing e-commerce adoption.

According to Bagozzi (2007), there is an urgent need to test and understand the factors that influence technology adoption and its various usages more clearly via more than one model and theory. A recent study by Awa et al. (2010) added the OTE model to the TAM constructs to understand the uptake of e-commerce among SMEs. They found this conjunction was more comprehensive in understanding and predicting behaviours and e-commerce adoption.

#### **2.4.4 Diffusion of Innovation Theory (DOI)**

Tornatzky and Klein (1982) stated that the Diffusion of Innovation Theory (DOI) from Rogers has been used since the 1960s to study a variety of organisational innovation. Most research has adopted a definition of innovation diffusion similar to that of Rogers (1995), which is, “the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). Through this definition, Rogers classified three basic elements leading to the diffusion of innovation:

1. The use of communication channels that would smooth the progress of the diffusion of innovation.
2. The required time to achieve this diffusion.

3. The members of the social system who influence the decision to adopt innovation diffusion.

In order to achieve the success of this innovation and its diffusion, these elements are considered to complement each other. Therefore, the failure of any of them makes it difficult to adopt the diffusion of innovation by individuals or firms.

According to Rogers' definitions, communication-suitable channels come as a first step and main base for moving towards the adoption of innovation. In fact, the Internet is regarded nowadays as the most effective channel of communication used at the level of individuals or firms. Its effectiveness is highlighted when constant contact is crucial around the clock, especially when communication between users is geographically aloof. In addition, it is the most rapid low-cost way to exchange information between users compared with other traditional communication channels, which are time-consuming and face increasing costs.

The second element of the elements referred to by Rogers in the process of innovation diffusion was time, which he considered to be a helpful factor and complementary in the adoption of this process. In order to scientifically measure time in the adoption of innovation diffusion, Rogers explained that this can be done by setting fixed percentages

synchronised with time. This ratio represents the class or level that defines the acceptance and adoption of innovation by individuals within the social system. For example, Rogers classified five levels for those individuals within the social system combined with a gained percentage as shown in Figure 2.5, which is known as Rogers' Innovation Adoption Curve. The curve begins with innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and finally, after a period of time for each level comes the last level of laggards (16%).

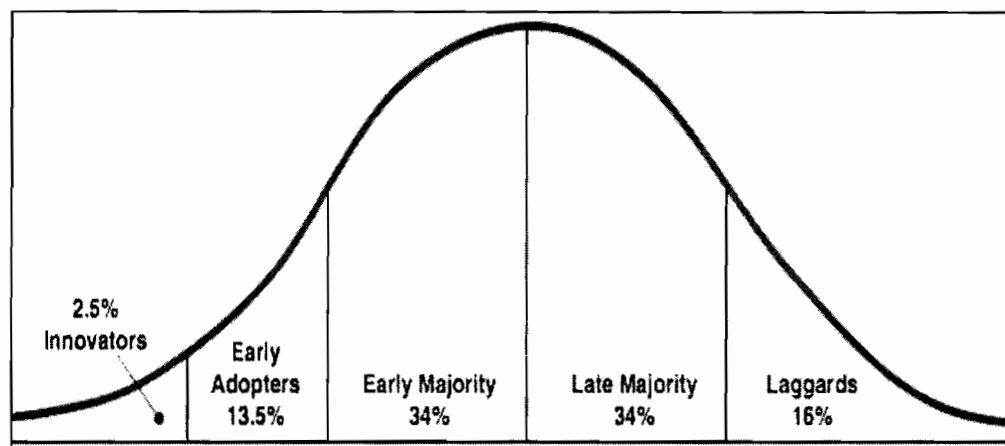


Figure 2.6  
Rogers' Innovation Adoption Curve  
*Source: Rogers, 1995*

According to this classification, Rogers mentioned that the level of the situation affects the decision of whether or not to adopt the innovation, as shown in Figure 2.6.

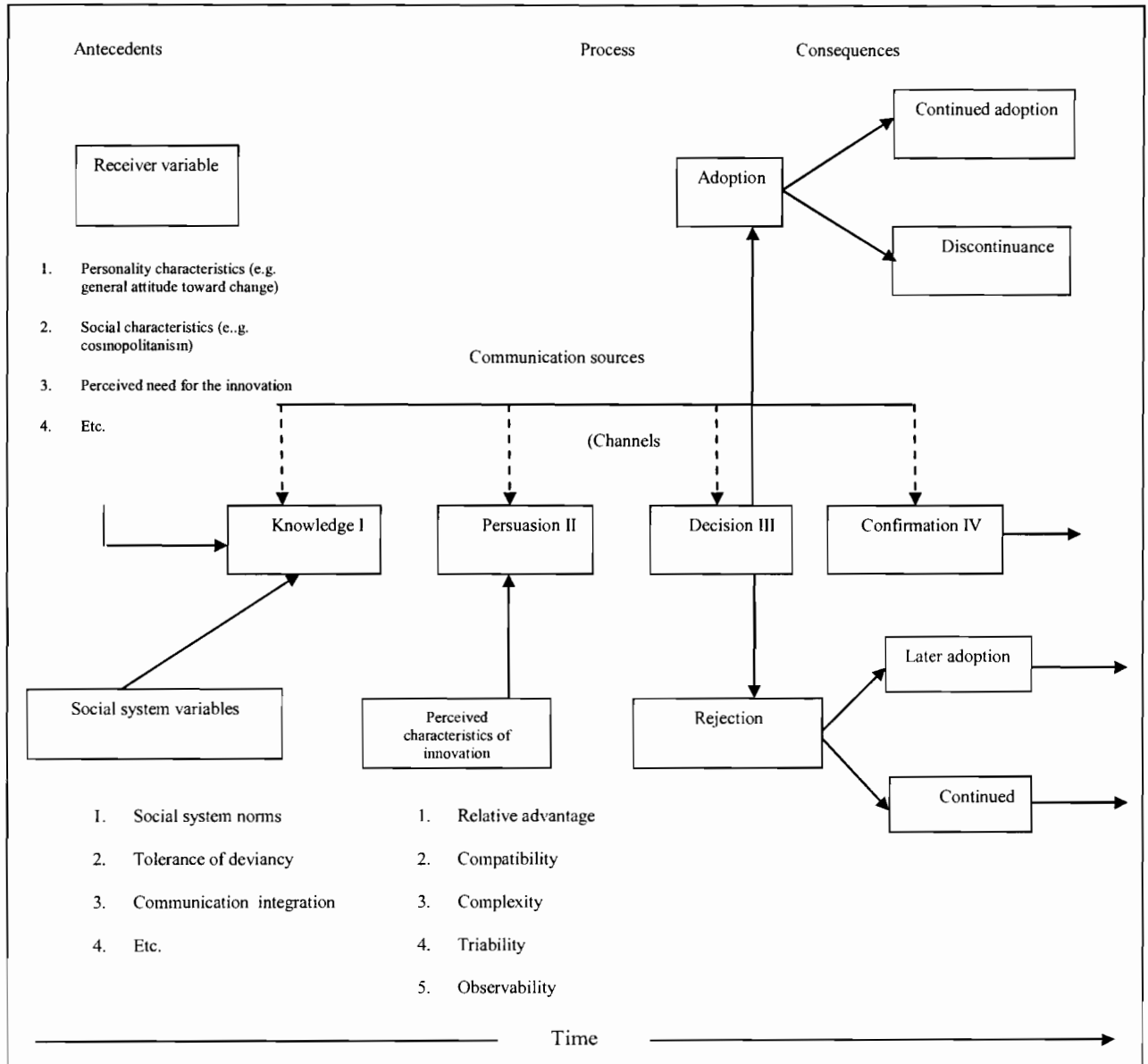


Figure 2.7  
Diffusion of Innovation Process Model  
Source: Rogers, 1995



Therefore, he added that these levels go through five stages, including the following:

1. Knowledge. This stage is important and has a proportional impact, since it was the starting point in the decision to adopt or reject the innovation. In other words, whenever the information is more aware and understandable to the adopter, this would enhance the decision to adopt and the adopter would then continue to the next stage and vice versa. Therefore, it is important to provide enough information at this initial stage to assist the adopter in positively making the decision with respect to the adoption.
2. Persuasion. The persuasion of adopting new processes or ideas in business is based on the clarity of vision of the adopter. In addition, the adopter's knowledge and the information that has been provided will give him or her the opportunity to make the decision convincingly. In this way, the chance is still available for the adopter to accept the adoption and continue to the next stage, as long as he or she has been provided with adequate information making him or her freer without confusion to make a decision.
3. Decision. Rogers (2003) stated that this stage is the most difficult due to the fact that the decision making is considered to be a watershed between acceptance and continuation on the one hand, and rejection and neglect on the other. This is the stage where the nature of the individual and the reactions surrounding him will affect his decision. Moreover, in this stage,

the adopter will compare the benefits gained and the damage that results from the decision to adopt. On the other hand, achieving positive results will assist the adopter in continuing the process of implementing the innovation.

4. Implementation. At this stage, Rogers (2003) pointed to the importance of supporting the adopter as much as possible and of attempting to prompt confidence in the adopter's decision to accept the innovation. In addition, he or she should be given a chance to know more about the possible benefits and costs to be had from this adoption – in particular, any potential negative and counterproductive effects that may lead the adopter to go back on the decision to adopt. On the other hand, the opposite is true if it becomes clear that this application was good for him or her and this will assist the adopter in becoming more convincing and confirming the continuation.
5. Confirmation. At this stage, the adopter who ultimately made the decision to adopt has realised the benefits from the application for this adoption and can now be looking forward to other applications that could bring further benefits. However, Rogers (2003) stated that the adopter may be disappointed due to the long time that may be spent without achieving other positive outcomes. In addition, some negative external responses from pessimists may affect the adopter's willingness to continue. These reasons may lead the adopter to end the application at this stage. Therefore, focusing

on supporting and assisting the adopter is very important in even the advanced stage.

These principles and concepts led Rogers to pay attention to the theoretical study of innovation while practically determining the factors that could help the individual or firm to adopt the innovation diffusion, especially in our era that is characterised by digital and information technologies. Therefore, Rogers established his famous theory on five factors that could assist researchers in their study of the intention to use the innovation by adopter and a key to knowing the actual usage.

Figure 2.8 shows Rogers' theory of innovation diffusion, including the attributes of innovation factors: relative advantage, compatibility, complexity, trialability, and observability. These factors or characteristics have been defined earlier.

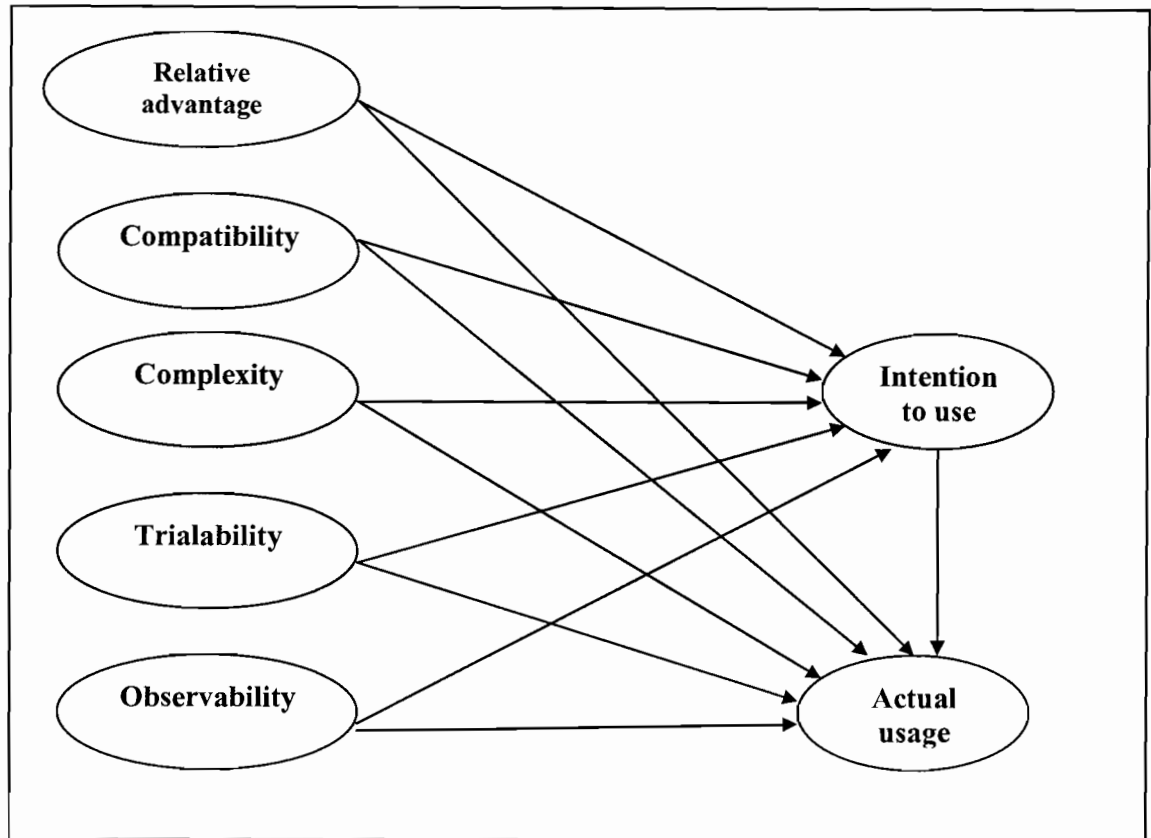


Figure 2.8  
Attributes of Innovation  
*Source: Rogers, 2003*

Finally, the concept of the innovation among individuals and firms requires research and focus on the previous studies that carry the theory that proved useful in achieving satisfactory results, particularly with regard to the sense, intention, and attitude towards new things and ideas.

Some of the characteristics of DoI are appropriate for the current study. In addition, DoI has been used in many previous studies at the level of individuals or firms, particularly SMEs. Moreover, its factors help to understand the trend of the decision maker towards the implementation of new mechanisms in the workplace, particularly the information technology mechanisms such as e-commerce (Al-Qirim, 2005; Mirchandani & Motwani, 2001; Tan, Chong, Lin and Eze, 2009; Seyal et al., 2004; Wymer & Regan, 2005). Table 2.3 addresses some of studies that have used the DoI theory.

*Table 2.3*  
*Studies That Have Used DoI*

Study	Type of Company	Study object
Thong (1999)	166 SMEs	Information System (IS) adoption
Iacovou et al. (1995)	7 SMEs	EDI adoption
Chwelos et al. (2001)	286 SMEs	EDI adoption
Kuan and Chau (2001)	575 SMEs	EDI adoption
Al-Qirim (2005)	129 SMEs	E-commerce adoption
Jeon et al. (2006)	204 SMEs	E-business adoption
Kohn and Husig (2006)	33 SMEs	Innovation software
Lee (2004)	71 SMEs	Internet technologies
Lertwongsatien and Wongpinunwatana (2003)	386 SMEs	E-commerce adoption

Mehrtens et al.(2001)	7 SMEs	Internet adoption
Mirchandani and Motwani (2001)	62 SMEs	E-commerce adoption
Mole et al. (2004)	218 SMEs	Soft process technologies
Seyal et al. (2004)	54 SMEs	E-commerce
Wymer and Regan (2005)	102 SMEs	E-commerce adoption
Tan, Chong, Lin and Eze (2009)	406 SMEs	Internet-based ICT adoption

## 2.5 The Culture Effect

Culture is defined as the “collective mental programming of the mind which distinguishes the members of a group or category of people from another” (Hofstede, 2001, p. 9). Given the proliferation of the Internet in the current era between the various businesses as a quick means to complete work, it is important to know and understand the cultural dimensions affecting this e-dealing.

Several studies have taken the cultural factor into account (Marino et al., 2002; Katz & Townsend, 2000; Yoon, 2009; Chau et al., 2003; Kumar et al., 1998; Shore & Venkatasachalam, 1996; Carayannis & Sagi, 2001; El Said & Galal-Edeen, 2009; Driksen, 2001; Douglas & Craig, 1997; Baker et al., 2009; Okazaki, 2004; Karahanna et

al., 2005; Twati & Gammack, 2006; Straub, 1994). These studies have shown that culture is an important factor as an influence in the adoption and use of technology. Ives and Jarvenpaa (1991), in their exploratory study with interviews of 25 senior managers of multinational organisations, noted that culture has an impact on the business of multinational organisations. They also stated that organisations sensitive to the local culture of their country of operation are more successful.

Likewise, Straub (1994) conducted a longitudinal study to answer the question of how societal beliefs and values of the Arab world affect the use and acceptance of ICT. From Questionnaire 274, knowledge workers in five Arab countries reported that the results acknowledged cultural differences in the adaptation of technology to the cultural context. It was suggested that managers should attempt to work with, rather than against, prevailing cultural patterns, particularly with workers who have not been technologically cultured. Moreover, Straub et al. (2001), in their empirical study, suggested that culture is an important variable in the development process and it may introduce its own set of problems, the consequences of which may range from project failure to delayed delivery of working systems.

Shore and Venkatasachalam (1996), in their empirical study, stated that culture is one of the most important variables that affects the use of IS, including e-commerce Web sites.

In addition, Douglas and Craig (1997) examined the critical issues responsible for changing the dynamics of consumer behaviour. The main findings of their theoretical study provided an important insight into the changing dynamics of consumer behaviour on e-commerce Web sites. Culture was the most important factor found.

Kumar et al. (1998) noted that IS and other technologies carry within them the culture of the developing nation and its programmers; it also carried within it the way of doing business in the area where it was developed. Thus, when these technologies are imported into alien cultures, they can fail due to cultural differences. Harris and Davison (1999) studied the examination of computer anxiety and involvement with ICT using six groups of computer-using undergraduate and graduate students in China, Hong Kong, Malaysia, New Zealand, Tanzania, and Thailand. Cultural differences were found to exist between the ICT involvements of some of the groups. They measured differences in computer anxiety, which was found correlated strongly with national cultural differences and gender. Moreover, Simon (2001) reported that cultural differences influence ICT due to the gender different role in ICT initiatives and its perception.

Hassan and Dista's (1999) in their qualitative study about IT adoption that was conducted in the Middle East, West Africa, and Australia. The authors tested the two regions on the cultural dimensions proposed by Hofstede and concluded that resistance



to change and the fear that ICT will upset the social order are highly significant factors that inhibit the adoption of ICT in Saudi Arabia and the United Arab Emirates. Katz and Townsend (2000) conducted an empirical study in Japan, France, and the United States. The result of the study indicated that most managerial decisions that are effective in one country may not necessarily be as effective in another country due to cultural differences. These differences are based on the dimensions of cultural differences presented by Hofstede.

Carayannis and Sagi (2001) conducted an exploratory study to measure how the culture of the development team affects the completion of an IS project. Results indicated that cultural differences affect the success of the system's development process. The differences in the culture of international development teams can have both positive and negative impacts on the timely completion of IS projects. Okazaki (2004) examined 150 multinational e-commerce Web sites based on information content, cultural values, and creative strategies. The results showed that Japanese users are likely to localise their Web sites due to cultural differences in the market. Karahanna et al. (2005) studied the levels of culture and individual behaviour of workers in organisations. They indicated that cultures have a main effect on organisations and that behaviours with a power task are affected by organisational and professional cultures.

## **2.6 Summary of the Chapter**

This chapter has reviewed the history and future of the Internet as evidence of the importance of e-commerce in Saudi Arabia. In addition, the chapter discussed the historical perspectives of Internet use and the current developments at Saudi SMEs and Saudi Arabia's Internet-related policy framework. The chapter also discussed SMEs adopting an e-commerce overview and reviewed the application of Tornatzky and Fleischer's (1990) model and literature relating to studies that have adopted the model and pursued e-commerce adoption. Moreover, the chapter reviewed theories related to innovation adoption, such as the Theory of Reasoned Action, the Diffusion of Innovation Theory, the Theory of Planned Behaviour, and the Technology Acceptance Model. Furthermore, culture and literature related to the effect of culture on e-commerce adoption were reviewed.

The comprehensive reviews of Tornatzky and Fleischer's (1990) model, theories related to innovation adoption, the effect of culture, and e-commerce adoption literature developed an understanding of the relationship that exists between these contexts. In addition, the reviews also led to developing the hypotheses and theoretical framework of the current study, which will be discussed in detail in the next chapter.

## **CHAPTER THREE: HYPOTHESES AND THEORETICAL DEVELOPMENT**

### **3.0 Introduction**

In an attempt to guide the development of the study, the researcher has developed a conceptual model based on the literature. The basic conceptual framework has been adopted from the organisation-technology-environment (OTE) model (Tornatzky & Fleischer, 1990). The model illustrates the degree of organisational context (firm size, owner's attitudes, owner's innovativeness, and owner's knowledge), the degree of technology context (relative advantage, compatibility, and complexity) and the degree of environmental context (information intensity and competition intensity). In addition, the model also proposes that there are four moderating degrees of culture: power distance, uncertainty avoidance, individualism, and masculinity. Figure 3.1 depicts the proposed model.

In this study and perhaps for the first time, the moderating effect of cultural context on the OTE model has been included. According to Hofstede's typology (1980, 1997, 2001), Arab countries, to which Saudi Arabia belongs, were classified as having high power distance, high uncertainty avoidance, low individualism, and high masculinity.

However, this study will postulate that perceptions of these cultures would differ among owners of SMEs in Saudi Arabia.

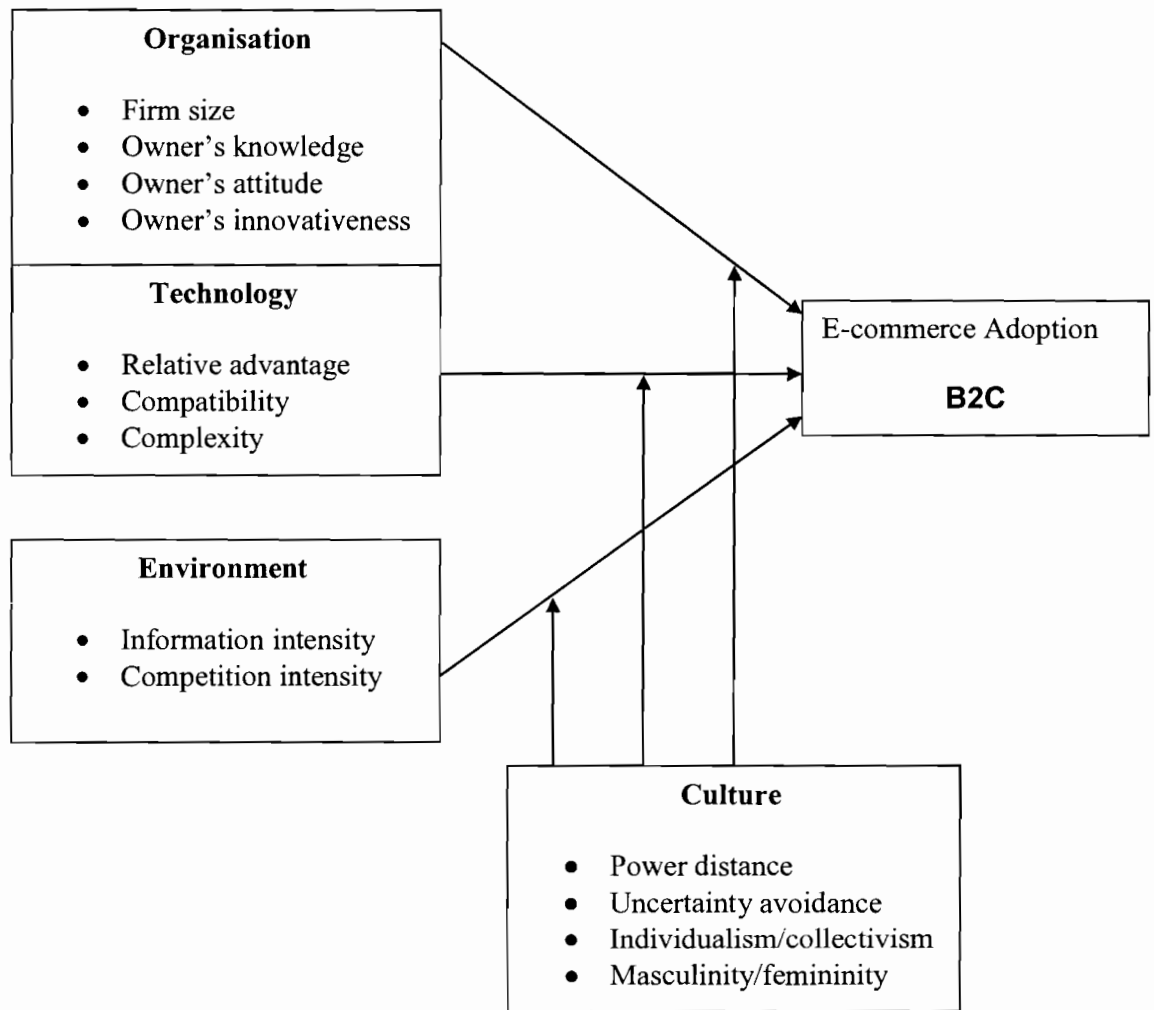


Figure 3.1  
The Proposed Research Model and Hypothesised Relationships

### **3.1 Organisational context**

One of the most vital elements that will influence the adoption of e-commerce technology by SMEs in Saudi Arabia in many ways is the nature of the firm, including the different characteristic elements manifested within the organisation. This section of the research paper examines the different organisational characteristics, such as firm size, the character and attitude of the owner, knowledge and innovativeness, and extent of influence of these characteristics in the acceptance and diffusion of e-commerce technology within the firm.

#### **3.1.1 Firm size**

The size of the firm or organisation is one of the key adoption factors. Previous research on the subject has suggested that smaller firms may have a reduced chance of adopting e-commerce. However, in those small firms that do adopt information technology, certain individual factors were identified as the key elements that drive adoption of technological innovation. Examples of these factors are perceived benefits, relative advantages, compatibility, complexity, proactivity towards technology, trialability, and financial resources. The size influences a firm's ability and readiness to adopt e-

commerce; moreover, it can influence the extent to which technology will be adopted by the firm. This simply means that larger firms tend to adopt technology at higher levels, while smaller firms are inclined to adopt technology at lower levels (Cragg & Mills, 2009).

A firm's prior usage of technology in the form of PCs with modems and an affinity towards the Internet and e-mail will also affect the diffusion of the new innovation. A firm with a large amount of transactions and data is more likely to adopt e-commerce, as this can be of great assistance in streamlining operations and offering process efficiency within the firm (Thong & Yap, 1995).

Teng (2000) conducted an empirical study to examine factors and their influence on determining the level of Internet commerce adoption in small businesses. The researcher observed that business size would significantly determine the extent of Internet commerce. Moreover, Karakaya and Khalil (2004) in their study of 94 SMEs stated that company size is one of the most influential factors of Internet adoption among SMEs. Chang-Shuo (2006) investigated the OTE determinates of e-commerce adoption of SMEs in Taiwan. The results showed that firm size is a stronger influence on e-commerce and large firms have more ability to adopt e-commerce. Thus, the following hypothesis is formulated:

**Hypothesis (1):** There is a significant relationship between the firm size and the e-commerce adoption.

### **3.1.2 Owner's attitude**

The adoption of e-commerce by SMEs relies heavily on the acceptance of e-commerce technology by business owners. If the owner does not identify with the usefulness of technology or has a limited understanding of its potential, then naturally the owner will be reluctant to adopt e-commerce. However, if the attitude of the owner is positive – that is, if he or she is well aware of the intricacies of computers and has some knowledge of technology and how to reap its benefits – then the business is likely to adopt e-commerce (Lubbe & Heerden, 2003).

Another case where an owner is likely to adopt e-commerce for the business is on the recommendation of experienced people. Before investing in the adoption e-commerce, the owner also considers the return the investment will bring. This concern for the return on investments may often lead to small- and medium-sized firms being more anxious on their mid-term survival rather than on their long-term viability (Lubbe & Heerden, 2003). Henceforth, most SME owners are often hesitant to make investments when short- or medium-term returns are not guaranteed. Moreover, previous studies found that

management's attitude and support of owner's attitudes had a positive relationship with e-commerce (Seyal & Rahman , 2003; Levy & Powell, 2003). Recently, a study conducted by Chang-Shuo (2006) found that CEO's attitudes had a positive relationship with the e-commerce adoption.

In the case of the adoption and implementation of e-commerce within the business mechanism of SMEs, the need for commitment from owners or top management and support during the process of assessment of the innovation or technology is of the utmost importance. Support and commitment on the part of the owner or top management ensures that there is an obligation within the resources, which in turn will create a conducive environment within the firm for the adoption process of the technology. Thus, the following hypothesis is formulated:

**Hypothesis (2):** There is a significant relationship between the owner's attitude and the e-commerce adoption.



### **3.1.3 Owner's innovativeness**

Lee and Runge (2001) identified three precursor factors in IT adoption among SMEs retailers: (a) the perception of the owner on the relative advantage of using IT; (b) the social expectations on the usage of IT; and (c) the owner's innovativeness in managing the business. The researchers found that among the three antecedent factors, the owner's innovativeness was the strongest determinant for the adoption of information systems (Lee & Runge, 2001). In addition, Thatcher et al. (2003) studied the relationships between cultural dimensions and personal innovativeness with IT. They found personal innovativeness affected cultural dimensions. Moreover, Sanchez (2002) stated that firms need innovative leaders who take care of e-business as a strategic business decision. An innovative owner will definitely identify the advantages of incorporating e-commerce into the business and accordingly be able to create new benefits for the business through an innovative utilisation of e-commerce technology among SMEs (Al-Qirim, 2005). Thus, the following hypothesis is formulated:

**Hypothesis (3):** There is a significant relationship between the owner's innovativeness and the e-commerce adoption.

#### **3.1.4 Owner's technological knowledge**

An owner's technological knowledge is another significant factor that influences the adoption of e-commerce (Dubelaar, Sohal, & Savic, 2005). If the owner is well-versed with global technological developments and the benefits that can be harnessed from these technological advancements, then he or she will be more likely to adopt technology in the form of e-commerce. Lack of technological knowledge on the owner's part will inhibit the adoption.

Antonelli, Ravarini, and Tagliavini (2001) conducted a study of an evaluation model for e-commerce activities within SMEs. They stated that lack of knowledge is the main barrier to the use of e-commerce and ICT among SMEs. Mallah (2003) investigated barriers to e-commerce adoption by small and medium enterprises in Saudi Arabia. The study also found that the relationship between the status of e-commerce and the perception of lack of knowledge as a barrier is statistically significant. Recently, a study conducted by Chang-Shuo (2006) found that CEOs' technology knowledge had a significant relationship with e-commerce adoption among small enterprise size in the case of B2C. Thus, the following hypothesis is formulated:

**Hypothesis (4):** There is a significant relationship between the owner's technology knowledge and the e-commerce adoption.

### **3.2 Technology context**

The technology context for the adoption of technology by SMEs in Saudi Arabia highlights the different technological aspects that influence the adoption and the extent of their influence. For example, technological elements like the relative advantage that the firm will benefit from through the adoption, compatibility, and complexity of the relevant technology to their existing business mechanisms is likely to influence the adoption process.

#### **3.2.1 Relative advantage**

Relative advantage is the extent to which the potential adopters and the customers perceive the new idea or innovation as superior to the current and existing conditions. According to Rogers (2003) relative advantage is "the degree to which an innovation is perceived as being better than the idea it supersedes". In simpler terms, relative advantage describes the amount of benefits and detriments a firm will experience for

adopting or rejecting a new innovation or technology, respectively (Teo et al. 1997). The extent of relative advantage is generally measured in terms of saving time and effort, the economic profitability, the reduction of costs, and the increase in production (Looi, 2005). Previous studies (e.g., Looi, 2005; Scupola, 2009; Cao, Gruca, & Klemz, 2007; Kwon and Zmud, 1987; Al-Qirim, 2006; Ching and Ellis, 2004; Li, 2008) agree with relative advantage as a good factor to evaluate the innovation diffusion or adoption rate.

Rogers' classical theory on diffusion of innovations, which has been widely used in the literature of the past, highlights five of the identified elements of an innovation that are the main determinants, explaining 49 percent to 87 percent of the discrepancy in the rate of e-commerce adoption (Hussin & Noor, 2002). On the basis of Rogers' "Diffusion and Innovation Model," these five aspects under identified characteristics of innovation were adopted in order to test the perception of SMEs en route to the adoption of e-commerce technology. One of the five identified characteristics of innovation of e-commerce was relative advantage. Relative advantage implies the perceived benefits that can be reaped by SMEs through the adoption of e-commerce to facilitate a particular enterprise's business activities, as measured by wider market exposure, lower business costs, business process, and efficiency (Rogers, 1983, 2003). Seyal and Rahman (2003) stated that relative advantage is an insignificant contributor to adoption, due to the fact that

most firms are not sure about perceived benefits from e-commerce. Thus, the following hypothesis is formulated:

**Hypothesis (5):** There is a significant relationship between the relative advantage and the e-commerce adoption.

### **3.2.2 Compatibility**

The second of the five essential characteristics identified by Everett Rogers that plays a critical role in enhancing the rate and effectiveness of the diffusion of an idea within an enterprise, a business firm, or an industry is the compatibility factor. This second characteristic of compatibility is concerned with gauging the compatibility of the idea, in this context adoption of e-commerce by SMEs in Saudi Arabia, with the past experiences and needs of the SME and the existing values (Vanderslice, 2000). Firms generally tend to adopt technologies that are in league with certain internal experiences and values – that is, technology that is consistent and within the limits of the firm and with those technologies that will become available in the future. If the firm has to make minimal changes or adjustments for the new innovation, then there naturally will be less resistance to the adoption. In addition, the compatibility of the new innovation with the mechanism of the firm will ensure greater security and minimal risk to the prospective

adopter and, overall, make the idea of new innovation more meaningful and useful for the firm (Thompson & Yujun, 2003).

Another widely investigated aspect of the compatibility of innovation with a firm has been how the new technology will fit in with the experiences of the potential adopters and enhance their tasks. Resistance to change is one of the common elements faced by most firms and SMEs when it comes to adoption of new ideas and technologies. Hence, if the adoption is of any new technology that requires minimal changes within the SME, its values, culture, working processes, and infrastructure, then it is more likely for a firm to adopt the new technology (Al-Qirim, 2007).

However, the compatibility factor may not always guarantee a successful e-commerce innovation within the SME, but its presence or absence does affect the rate at which e-commerce technology gets adapted to a great extent (Al-Qirim, 2006). The compatibility factor delves into queries like how e-commerce will fit in with the cultural perspectives of the region and whether the technology will be able to acclimatise with the population's past experiences and satisfy their present needs (Rogers, 2003). If, at any moment, the members of the culture feel that they have to become different in order to adopt the technology or to utilise it, then naturally they will resist the adoption. But among these, the most important issue is whether e-commerce technology will be

compatible and advantageous to the current business dynamics of the particular SME. Grandon and Pearson's (2003) empirical study looked at strategic value and adoption of e-commerce in Chilean SME businesses. They found that the compatibility was statistically significant as determinants of e-commerce adoption with a firm's culture and values. Thus, the following hypothesis is formulated:

**Hypothesis (6):** There is a significant relationship between compatibility and the e-commerce adoption.

### 3.2.3 Complexity

The third characteristic out of Everett Rogers' five essential elements from his theory of diffusion of innovation, which is being used as a reference model to understand the adoption of e-commerce technology by SMEs in Saudi Arabia, is complexity. In the technological context, this relates to the level of ease or complexity with which the e-commerce technology can be understood by the SMEs (Vanderslice, 2000). Henceforth, the adoption or the adoption process of the innovation, as in e-commerce technology, depends upon the time the SMEs take to understand the intricacies of the e-commerce technology mechanism, its application, and the advantages and benefits that can be harvested through its proper utilisation in their individual businesses. Basically, the

easier to understand the technology and its application, the faster and more immediately the adoption process and vice versa.

Complexity in the adoption of an innovation also refers to the degree a member of the firm as a whole possesses a comparatively higher level of skill and knowledge (Rogers, 2003). This is usually measured by the member's or the firm's array of occupational expertise and their professionalism that is expressed by formal training. A complexity in expertise and specialisation encourages firms to adopt new innovations and ideas.

Al-Gahtani (2003) examined the innovation attributes to computer adoption. The study's findings confirmed there is a significant negative relationship between complexity and computer adoption in Saudi Arabia. In addition, Seyal and Rahman (2003) studied the association between complexity and e-commerce. They found no association between the two. A study conducted by Chang-Shuo (2006) found that CEOs' perceptions of complexity of e-commerce and the e-commerce adoption was statistically insignificant. Thus, the following hypothesis is formulated:

**Hypothesis (7):** There is a significant relationship between the complexity and the e-commerce adoption.



### **3.3 Environmental context**

The environment that surrounds a firm is also one of the vital aspects that influence the adoption of new technology. For instance, the environment could be the intensity of information required to address the full extent of the characteristics of a particular service, and the competitions that surrounds the products and services of the SMEs.

#### **3.3.1 Information intensity**

The rapid advancements made by information technology have changed the policy of firms who conduct business, especially regarding selling their products and services. Today, most of the products and services come with information regarding the characteristics, nature, and method of usage. The more complex the product, the more information is required to describe the product and services (Malone et al., 1987).

SMEs in a more information-intensive environment are more likely to adopt e-commerce technology (Pavic et. al 2007). For instance, SMEs in service-oriented industries are likely to have higher information content in their products and services in comparison to SMEs in manufacturing-oriented services. Hence, SMEs that are oriented to the service industry are more likely to adopt e-commerce technology (Thompson &

Yujun, 2003). Al-Qirim (2007) investigated the impact of information intensity on the adoption of e-commerce applications among SMEs in New Zealand. The results found the information intensity was influenced by the adoption of Web sites. Thus, the following hypothesis is formulated:

**Hypothesis (8):** There is a significant relationship between information intensity and the e-commerce adoption.

### **3.3.2 Competition intensity**

The general view held by all economists is that competition increases the chances of adoption of an innovation. Porter (1979), in his *Harvard Business Review* article, “The Five Competitive Forces that Shape Strategy”, identified five such competitive forces: new entrants, threat of substitute, bargaining power of customers, bargaining power of suppliers, and rivalry among current competitors that shape the competitive business strategy of a firm. It was further suggested that the adoption of IT will change the competition environment in three ways by changing the structure of the industry, changing the rules of competition, and giving businesses new methods by which to gain competitive advantage over their competitors (Porter, 2008). Previous studies have shown that intensity of competition is associated with the degree of e-commerce

adoption, too (Lertwongsatien & Wongpinunwatana, 2003; Forman, 2005; Iacovou et al., 1995; Dos Santos & Peffers, 1998).

Recently, a study conducted by Sandy and Graham (2007) examined the factors influencing the extent of the deployment of e-commerce for SMEs. The study found that competitive pressure was a major factor affecting e-commerce among SMEs. In the context of SMEs in Saudi Arabia, the market of this Middle East nation is comparatively very small. Therefore, in e-commerce the SMEs of Saudi Arabia will have a low-cost alternative to advertise their services and products on a global scale, as well as find suitable business partners from around the globe. Thus, the following hypothesis is formulated:

**Hypothesis (9):** There is a significant relationship between the competition intensity and the e-commerce adoption.

### **3.4 Cultural context**

According to Hofstede (1991, 2001), national cultures vary from one another on five dimensions: power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, and long-term orientation against short-term. Previous studies

mentioned that among these five dimensions, the first four cultural dimensions are inconclusive in regard to the adoption and diffusion of a new technology (Gaspay, Dardan, & Legorreta, 2008). But this does not in any way imply that the quadrant of cultural dimensions is irrelevant to the study of e-commerce adoption by SMEs in Saudi Arabia. This section of the research paper identifies the four cultural dimensions eminent in Saudi Arabia and evaluates their moderating effect in the adoption process of e-commerce technology.

#### **3.4.1 Power distance**

Power distance refers to the “extent to which less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally” (Hofstede, 2001). Power distance is a dimension of culture that focuses on the orientation of authority – that is, the inequality of the distribution of power within a firm or a country. Power distance may also be defined as the extent to which a member of a firm or an institution within a country accepts that the distribution of power is unequal. In countries like Austria and Israel, which are characterised by low power distance, it is generally believed that inequalities among the population should be minimised, while in high power distance countries like Malaysia, Guatemala, and Saudi Arabia, the inequalities are more or less expected and desired (Maitland, 1999). In a firm, the

division of power is mirrored in the hierarchy. Therefore, the authority and the usage of prescribed rule and centralised decision structures are often the characteristics that define firms in nations with higher power distance. Such firms are usually associated with lower rates of adoption of innovations. Cultures that are defined with a high power distance are usually expected to be less open and less enthusiastic to new ideas and innovations, as this often involves making decisions on matters where there is limited information or few historical trends (Erumban & Jong, 2006).

Previous studies (e.g., Lim, 2004; Kollmann et al., 2009; Tawati, 2008; Yoon, 2009; Gong, Li, & Stump, 2007; , Goo, Hu & Nam, 2009) have examined the moderating effect of culture on technology adoption. They stated that culture has an important effect and argued the role of the moderating effect of power distance on the Internet and e-commerce adoption. Thus, the following hypotheses are formulated:

**Hypothesis (10):** Power distance moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (11):** Power distance moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (12):** Power distance moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

### **3.4.2 Uncertainty avoidance**

Uncertainty avoidance is defined as, “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede, 1991, p. 113). The quintessence of uncertainty is that it is derived from more of a subjective experience. However, according to Hofstede, the feelings of uncertainty are not always personal; the feelings of uncertainty may also be shared among the other members of a culture, more so if the society and the culture of a nation is a close-knit one (Hofstede, 1991). Risk taking, which is more often associated with an entrepreneurial activity, is an important factor when adopting a new idea or innovation, as there is always an element of doubt and uncertainty. The adoption of a new technology that is a form of a new idea or an innovation certainly involves uncertainty and related risks. The incorporation of a new idea or the adoption of a new technology is similar to making an investment with uncertainty. If the main concern of adopting a new technology is fear of doing something new, the greater the uncertainty that is attached to it. On the assumption that technology works, a question will arise as to whether it can be used in profitable way; hence, the risk that comes through is largely an economic risk. Therefore, adoption of a

new technology for the first time is usually associated with ambiguity and uncertainty and firms with a high tally of uncertainty avoidance tend to be more adverse to taking risks and making changes (Erumban & Jong, 2006).

In countries that have low uncertainty avoidance, such as Denmark and Jamaica, it is a known fact that motivation comes from achievement, belongingness, and one's self-esteem. In these countries with low uncertainty avoidance, there is generally a high tolerance for out of the ordinary behaviours or new, innovative ideas. While in countries like Greece and Portugal that have strong uncertainty avoidance, the motivation for work comes from security, together with esteem and belongingness. In these countries with high uncertainty avoidance, generally there is resistance to the adoption of new ideas and innovations. These implications of uncertainty avoidance of countries make the adoption and diffusion of innovations clear. Nations characterised by low uncertainty avoidance cultures are more enthusiastic about adopting new innovations than the nations with high uncertainty avoidance cultures. Previous studies (e.g., Junglas & Watson, 2004; Kollmann et al., 2009; Singh, Zhao, & Hu, 2005; Dwyer, Mesak, & Hsu, 2005; Gallagher & Segars, 2003) have examined the moderating effect of culture on technology adoption. They argued that uncertainty avoidance has an important role in technology adoption. Thus, the following hypotheses are formulated:

**Hypothesis (13):** Uncertainty avoidance moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (14):** Uncertainty avoidance moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (15):** Uncertainty avoidance moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

#### **3.4.3 Individualism/collectivism**

The dimension of individualism refers to the relation of an individual to the firm to which he belongs. People in individualistic nations are more prone to making their own decisions and choices than people in nations whose cultures focus more on collectivism. Since adoption of a new innovation is contrary to the prevailing notion of collectivism, nations and firms that emphasise group values and norms more than others are less enthusiastic towards the adoption of new technologies or innovations. Likewise, people in individualistic nations and firms feel freer towards expressing their individual thoughts and views and, hence, are more apt to adopt new ideas and innovations (Erumban & Jong, 2006). However, these traits of collectivism and individualism fail to



directly address the issues of technological adoptions. The conclusions that are based on Hofstede's descriptions and analysis, advocating two contradictory hypotheses about the role of this collectivism and individualism factor that affects the diffusion of an innovation. According to the first hypothesis, the individualism paradigm is driven by GDP. This construct assumes the positive correlation between individualism and the adoption of new ideas. While on the other hand, in collectivist countries the first preference may be given to the need of communicating and providing services and products within the "group" first, which may create greater demands for e-commerce technology (Maitland, 1999). But taking into account the overall scenario of diffusion of innovations and adoption of new ideas, it is found that individualistic countries are more inclined towards the adoptions of new ideas and it is in these countries that diffusion of these ideas takes comparatively less time. The United States of America can be cited as an example. Previous studies (e.g., Lee et al., 2007; Thatcher et al., 2003; Karahanna et al., 2005; Lim et al., 2004; Yoon, 2009; Kollmann et al., 2009; McCoy et al., 2005; Gefen & Heart, 2006) have examined the moderating effect of the individualism dimension on technology adoption. They have different results depending on the level of individualism that the adopter had. For instance, Kollmann et al. (2009) found that individualism had no significant moderating effect on the relationship between organisational readiness and e-business adoption, while Gefen and Heart (2006) found

that the individualism dimension had an effect on trust beliefs in e-commerce adoption.

Thus, the following hypotheses are formulated:

**Hypothesis (16):** Individualism moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (17):** Individualism moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (18):** Individualism moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

#### **3.4.4 Masculinity/femininity**

A country having a masculine culture is characterised by ambition, a zest for competition, material values, and a focus on performance. Firms rooted in masculine cultures put more emphasis on recognition of performance, rewards, training, and the overall improvement of an individual. These characteristics are also found in innovative firms. Hence, one may expect countries with a higher masculinity to have a higher rate of adoption of new ideas and innovations than countries with low masculinity (Erumban

& Jong, 2006). However, this supposition that those countries with a high masculinity are more likely to adopt e-commerce technology has proved to be misguided in regards to the achievements and contributions made by women in all forms of life and, hence, are not so applicable in the present era.

Herbig (1994) proposed that countries with a higher equality in terms of gender are more innovative, as these nations will be able to tap into the potential knowledge of a comparatively larger percentage of the population. Hence, these nations will be able to offer a broader insight on the consequences of adopting new technology and the feasibilities concerning the adoption and diffusion process.

Previous studies (e.g., Srite & Karahanna, 2006; Venkatesh et al., 2004; Karahanna et al., 2005; Yoon, 2009; Kollmann et al., 2009; McCoy et al., 2005) have examined the moderating effect of culture on technology adoption. They argued that masculinity had a moderating effect on the intention of technology adoption. Thus, the following hypotheses are formulated:

**Hypothesis (19):** Masculinity moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (20):** Masculinity moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (21):** Masculinity moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

In order to properly enunciate the main subject of the research paper, collect relevant data and facts, analyse the facts, formulate the hypotheses, and reach a definitive conclusion, a research methodology is vital. Henceforth, the next chapter concerns the research design and techniques on all the evaluations in order to frame a relevant research methodology that can be applied to reach conclusions regarding the subject matter of the research paper.

## **CHAPTER FOUR: METHODOLOGY**

### **4.0 Introduction**

At the beginning of this study, research is been conducted to identify the research problem and to establish a theory. In this way, a model could be proposed that helps to reach a high awareness of the nature of the research problem and to identify the affecting factors relevant to the subject of study. Exploratory research may help to reach these targets (Aaker et al., 2004). Therefore, the researcher used this model as the initial stage through reviewing and reading the previous studies and researches that dealt with the same field of study to gain more knowledge and collect the information requested.

The researcher moved on after this stage to building a proposed model of the study, which could help in more clearly determining the nature of the problem. This model includes the contexts and factors that could help to answer the research questions and clarify the understanding and awareness of the participants towards the subject of study in question. Describing the details that are needed to know the intention, trend, perceptions, and characteristics of the participants towards adopting e-commerce in their

firm requires the use of descriptive design as discussed in Churchill and Iacobucci (2005). Therefore, the researcher used the design of descriptive research in this study.

Previous studies in the field of innovation diffusion and information technology applications were examined with a focus on the use and adoption of technology in general and e-commerce adoption among SMEs in particular. The literature review identified a model that analysed e-commerce adoption by SMEs. The review located a comprehensive model borrowed from social psychology as a theoretical groundwork for IT acceptance.

This research framework draws heavily on the DoI theory and the OTE model. The model includes four dimensions: (a) the organisational context; (b) the technology context; (c) the environmental context; and (d) the cultural context. This study included nine independent variables, four moderating variables, and one dependant variable as described in Table 4.1 This chapter also discusses the major variables and the research hypotheses. An exploratory and descriptive analytical methodology was used in the study.

*Table 4.1*  
*Contexts and Variables Name*

<i>Part</i>	<i>Context Name</i>	<i>Variables Name</i>
1	Organisational (IV)	Firm size Owner's attitudes Owner's innovativeness Owner's knowledge
2	Technology (IV)	Relative Advantage Compatibility Complexity
3	Environmental (IV)	Information intensity Competition intensity
4	Cultural (MV)	Power distance Uncertainty avoidance Individualism Masculinity
5	E-commerce adoption (DV)	B2C

#### **4.1 Research Design**

Babbie (2004) found that the survey is the tool most often used as a strategy in business and social researches. This feature is based on what was provided by survey research to collect large amounts of data in a short time and at low cost, in addition to the possibility of easy and accurate analysis of results by different statistical methods. The current study was applied in three areas in Saudi Arabia, of Riyadh, Eastern Saudi Arabia, and Mecca – which are considered the largest major areas in the kingdom. In addition, they

have the densest population of SMEs. Therefore, the researcher used a survey of strategy, which is considered the most used in studies that include a large number of participants. The strategy survey requires the use of appropriate research methods to gain results in a positive method. This method could assist the researcher later on in generalizing the results of the target sample of participants. The appropriate method in the research is based on the problem of the study, the experience of the researcher, and the participants in the research.

Sampling techniques are divided into two broad categories, probability and non-probability. In probability sampling, each unit or element in the sampling frame has an equally known, non-zero chance of being included in the sample, which allows for statistical inferences. This allows researchers to answer research questions and to achieve research purposes that require them to estimate statistically the characteristics of the population inferred from the sample. Probability sampling is often associated with survey and experimental research strategies. In contrast, in non-probability sampling, it is not possible to make valid inferences about the population. All non probability samples rely on personal judgment somewhere in the process, which implies that such samples derived from non-probability sampling are not necessarily representative of the entire population. Researchers may still be able to generalize from non- probability samples about the population, but not from a statistical standpoint. Non-probability



sampling is more generally used in case study research (Churchill & Iacobucci, 2005; Saunders et al., 2007).

The techniques in probability sampling include simple random sampling, systematic sampling, stratified sampling, cluster sampling, and multi-stage sampling. For non-probability sampling, the techniques are quota, purposive (judgemental), snowball, self-selection, and convenience.

Since the present study uses a survey research strategy, probability sampling is more appropriate than non-probability sampling. Aaker et al. (2004) stated that probability sampling has several advantages over non-probability sampling. First, it permits the researcher to demonstrate the sample's representativeness. Second, it allows an explicit statement as to how much variation is introduced because a sample is used instead of a census of the population. Finally, it makes possible the more explicit identification of possible biases. Moreover, probability sampling has been widely used in previous studies that have a similar construct to this study. "Today, probability sampling remains the primary method of selecting large, representative samples for social research" (Babbie, 2004). Probability sampling was therefore applied in this study.

In Saudi Arabia, the General Organisation for Social Insurance (GOSI) is a governmental organisation concerned with other government organisations that apply to the Ministry of Labour System with their employees, in addition to all private enterprises. GOSI also publishes modern statistical lists and information regarding these organisations or firms at the end of each year. In addition, GOSI provides these lists automatically on its official Web site. This data includes the number of firms, the number of employees, and the nature of their activity. Statistical reports issued by GOSI in 2008 pointed to the presence of 192,685 firms. The private sector comprises 99.4 percent of these firms. Table 4.2 describes Numbers of Firms in Area's Location. Therefore, the researcher used the list of SMEs in these areas as a framework for the current study to draw the sample.

*Table 4.2*  
*Numbers of Firms and Percentages in Area's Location*

<i>Area location</i>	<i>Numbers</i>
Riyadh	34,357
Eastern	25,624
Mecca	18,507

#### 4.1.1 Population and sampling

Population consists of all SMEs in Riyadh, Eastern Saudi Arabia, and Mecca. Sampling is done for each area (Cluster) based on simple random sampling. So the sampling technique is considered as Simple Cluster random sampling. In details, the following Table 4.3 gives the sampling technique being applied.

*Table 4.3*  
*The sampling technique*

Region	Population	Classified Sample	Collected Sample
Riyadh	34,357	400	180
Western	25,624	380	119
Mecca	18,507	370	101
Total	78,488	1,150	400

#### **4.1.2 Data Type and Collection Technique**

Data collected was primarily quantitative data. Information was sought from owners of the SME's. Data was designed in the scale. Structured questionnaire consisted of 5 types/likes of scale. Survey method was being applied.

#### **4.1.3 Research Instrumentation**

The study used survey questionnaires to gather pertinent data. Moreover, the questionnaire was structured such that SME owners were able to answer it easily. Thus, the set of the questions was structured using the Likert format. On this type of questionnaire, SME owners were given one of five response choices as the quantification of their agreement or disagreement on each question item.

The measuring variables used were developed via a thorough literature review on information systems and e-commerce domains. The literature was found to demonstrate acceptable reliability and validity. The questionnaires containing measures were tested in survey formation. Measured in five-point Likert scaling and completing the questionnaire in process, Dess and Robinson (1984) noted that subjective measures are appropriate for determining the technology-based performance of the SMEs developed by Rogers (1995), integrating in several technology-centred attributions of innovation in

B2C applications of e-commerce. The relationship of variables was measured using a simple summation of technology-centred satisfaction and e-commerce adherence. Table 4.4 describes the contexts of the questionnaire.

*Table 4.4*  
*Contexts of the Questionnaire*

<i>Part</i>	<i>Context Name</i>	<i>Questionnaire Developer</i>
1	Organisational	Seyal and Rahman (2003), Hurt et al. (1977) and Chang-Shuo (2006)
2	Technology	Seyal and Rahman (2003)
3	Environmental	Thong and Yap (1995)
4	Cultural	Dorfman and Howell (1988), Hofstede (1991)
5	E-commerce adoption	Wu et al. (2003)

#### **4.1.4 Pilot Study**

The questionnaire was the main instrument of the survey study. A pilot study was conducted to collect the information and perceptions on such e-commerce adoption determinants from SME owners. The questionnaire was designed to investigate these variables as mentioned, including organisational context, technology context, environmental context, cultural context, and the e-commerce adoption. According to

Gay (1996), interviews with the participants will determine the face validity of the instruments. Hence, the researcher interviewed groups of 10 SME owners; these were in the form of direct interviews in order to have their suggestions on each statement of the questionnaire and to guarantee that all the questions could be clearly understood by the participants.

In the actual data collection, the questionnaire was administered by using a combination of postal and telephone surveys. The content of the list includes the names, firms, phone numbers, and mail addresses of owners. GOSI provided the researcher with a list of computer database files that could reduce the complexity of the sampling procedure. Because all owners that participated in this survey were Saudi, the questionnaire was translated into Arabic (See Appendix B).

There was also a cover letter to explain the purposes of the study and to assure anonymity of respondents and provide instructions on how the questionnaire should be completed. Permission was obtained from each customer, who then participated in the study before beginning with the research. All data were collected from the respondents and were kept at a secure location. Moreover, the objective, purpose, and significance of the study was all transmitted to the participants before starting the research process.

#### 4.1.5 Description – Part one: Organisational context

Table 4.5 describes the firm profile. Three items were used in describing this part. A description of the firm profile and structure of the firm was developed by the researcher.

*Table 4.5*  
*Firm Profile*

<i>Item</i>	<i>Scale</i>	<i>Category</i>
Employees	5	Regular
Firm Location	3	Riyadh, Eastern Saudi Arabia, Mecca
Firm Web Site	Anonymous	Yes or No

Table 4.6 describes owner characteristics were developed by four items in the form of gender, age, education status, and ownership tenure.

*Table 4.6*  
*Owner Characteristics*

<i>Item</i>	<i>Scale</i>	<i>Category</i>
Gender	Anonymous	Female, Male
Age	5	Years
Education	6	Below High School, High School, Associate, Bachelor's, Master's, Doctorate
Tenure	5	Years

Table 4.7

*Variables and Questions of the Organisational Context*

<i>Variables Name</i>	<i>Question</i>
Owner knowledge	I can use a word-processing program (e.g., MS Word) to organise documents.
	I can use a presentation graphics program (e.g., MS PowerPoint) to present data.
	I can use a database program (e.g., MS Access) to manage data.
	I can use a spreadsheet program (e.g., MS Excel) to analyse data.
	I know how to use Web browser programs (e.g., Netscape, Internet Explorer).
	I can compose, send, and read e-mail messages.
	I use the Internet to gather information for my professional or personal life.
	I am familiar with the basic operations of a computer (e.g., move/copy files, save files, print documents, use a CD-ROM, etc.).
	I have attended computer classes.
Owner attitude	I believe that soon most businesses will be conducted using e-commerce.
	I believe that the use of e-commerce can enhance the standard of living.
	I believe that life will be easier and faster with the use of e-commerce.
	I believe that e-commerce is an efficient way to get information.
Owner innovativeness	I seek new ways to do things.
	I am generally cautious about accepting new ideas.
	I frequently improvise methods for solving problems when the answer is not pparent.



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I am suspicious of new inventions and new ways of thinking.

I rarely trust new ideas until I know if the majority of people around me accept them.

I consider myself to be creative and original in my thinking and behaviour.

I am usually one of the last people in my group to accept something new.

I am reluctant to adopt new ways of doing things until I see them working for people.

I tend to feel that the old way of living and doing things is the best way.

I am challenged by ambiguities and unsolved problems.

I am receptive to new ideas.

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The previous Table 4.7 and other constructs were measured using a five-point Likert scale system of strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). Thus, the questionnaire asked the research participants to select one answer choice for every question.

#### 4.1.6 Description – Part two: Technology context

Table 4.8 For technology, there can be such relative advantages, complexities, and compatibilities that further influence e-commerce adoption – for instance, the degree to which innovation is perceived as reliable with the value's adoption, which can be hard to utilise and realise within e-commerce of SMEs (Rogers, 2003).

Table 4.8

*Variables and Questions of the Technology Context*

<i>Variables Name</i>	<i>Question</i>
Relative Advantage	I perceive e-commerce to be advantageous, because it increases sales and enlarges market share for our firm.
	I perceive e-commerce to be advantageous when it reduces costs for our firm.
	I perceive e-commerce to be advantageous when it enables the development of new businesses for our firm.
	I perceive e-commerce to be advantageous, because it enhances our relationships with suppliers.
Compatibility	I perceive e-commerce to be highly compatible with our earlier experience of technological innovation adoption.
	I perceive e-commerce to be highly compatible with the values, beliefs, and business needs of our firm.
	I perceive e-commerce to be highly compatible with the e-commerce activities adopted by our suppliers and partners.
Complexity	I perceive e-commerce to be complex when our firm faces a lack of appropriate tools.
	I perceive e-commerce to be complex when our firm faces a lack of funding.

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I perceive e-commerce to be complex when our firm faces a lack of expertise.

I perceive e-commerce to be complex when our firm faces a lack of industry standard.

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#### 4.1.7 Description – Part three: Environmental context

Table 4.9 For the environmental aspect, the factors of information as well as competition intensity were used, as they can be presented within products and services of SME industries (Thong, 1999; Lertwongsatien & Wongpinunwatana, 2003). The items were developed by Thong and Yap (1995).

*Table 4.9  
Variables and Questions of the Environmental Context*

<i>Variables Name</i>	<i>Question</i>
Information Intensity	My firm is dependent on up-to-date information.
	My firm must have access to reliable, relevant, and accurate information.
	My firm must be able to access information quickly whenever it is needed.
Competition Intensity	Customers can easily switch to a competitor in this industry.
	The rivalry among firms in this industry is intense.
	Substitutable products and services affect our firm in this industry.

---

#### 4.1.8 Description – Part four: Cultural context

Table 4.10 For the cultural context, there is a cultural effect present in SMEs that could be due to differences of cultures adopted within the e-commerce process, as Hofstede (1991) provided in his analysis towards the culture of a firm. Thus, this research measured the moderating variable in culture, particularly how such factors provide a basis for e-commerce adoption leading to positive assumptions for certain B2C perspectives.

*Table 4.10  
Variables and Questions of the Cultural Context*

<i>Variables Name</i>	<i>Question</i>
Individualism	Group welfare is more important than individual rewards.  Group success is more important than individual success. Being accepted by the members of your work group is very important.  Employees should only pursue their goals after considering the welfare of the group.  Managers/owners should encourage group loyalty even if individual goals suffer.  Individuals may be expected to give up their goals in order to benefit group success.

Uncertainty Avoidance	<p>It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do.</p> <p>Managers/owners expect employees to closely follow instructions and procedures.</p> <p>Rules and regulations are important because they inform employees of what the organisation expects of them.</p> <p>Standard operating procedures are helpful to employees on the job.</p> <p>Instructions for operations are important for employees on the job.</p> <p>Meetings are usually run more effectively when they are chaired by a man.</p>
Masculinity	<p>It is more important for men to have a professional career than it is for women to have a professional career.</p> <p>Men usually solve problems with logical analysis; women usually solve problems with intuition.</p> <p>Solving organisational problems usually requires an active, forcible approach, which is typical of men.</p> <p>It is preferable to have a man in a high-level position rather than a woman.</p>
Power Distance	<p>Managers/owners should make most decisions without consulting subordinates.</p> <p>It is frequently necessary for a manager to use authority and power when dealing with subordinates.</p> <p>Managers/owners should seldom ask for the opinions of employees.</p> <p>Managers/owners should avoid off-the-job social contacts with employees.</p> <p>Employees should not disagree with management decisions.</p> <p>Managers/owners should not delegate important tasks to employees.</p>

#### 4.1.9 Description – Part five: E-commerce adoption

Table 4.11 For the e-commerce context, Ideally for a B2C analysis regarding e-commerce adoption, it is appropriate to recognise a business' value and processes from the business to consumer operation of SMEs – in particular, as to how the approaches mentioned do apply enough theories linking culture to the overall determinants of e-commerce adoption.

*Table 4.11*  
*Variables and Questions of the e-commerce Context*

<i>Variables Name</i>	<i>Question</i>
e-commerce B2C	Provide customers with general information about our firm (e.g., via Web sites, e-mail, information boards).
	Allow customers to locate and send information to appropriate contacts within the firm (e.g., via accessible online directories).
	Send customers regular updates about new products and other developments within our firm (e.g., via e-mail, what's new page).
	Provide solutions to customer problems via Web-based service solutions and allow them to track and inquire about their orders electronically (e.g., via accessible Web page about the status of stock and delivery).
	Provide after-sales service to our customers (e.g., via online information about installation and troubleshooting).
	Provide information in response to consumer questions or requests (e.g., via Q&A page, intelligent agents).
	Accept orders and payments electronically from customers.

## 4.2 Data Analysis

Both validity and reliability of the instruments were necessary for this study. In order to do so, most of the items were adapted from previous studies that are required in social science research. According to Gay (1996), the expert findings can determine content validity of the instruments. Hence, the survey instruments were reviewed by four academic researchers currently teaching in the field of e-commerce, marketing, economics, and static. Such a review aimed to address the content validity and the local cultural context within the Arab culture. Their feedback resulted in some refinement of the instrument, as well as additions, deletions, and rephrasing of some questions. In addition, Cronbach's coefficient alpha of each was to be above 0.70; that is sufficient for internal consistent reliability of social science research suggested by Leech et al. (2005).

Despite the achievement of both reliability and validity of the questionnaire by previous studies that are required in social science research, the researcher found that it was important to ensure it again, especially since the questionnaire was distributed to another population that has its own culture. According to the recommendations of participants regarding coordination of the questionnaire, some words were added (e.g., “strongly agree”, “agree”, “neutral”, “disagree”, and “strongly disagree”) in the list of every part

of the questionnaire and some shortcuts, if possible. All of these were taken into account and reprinted again as the final questionnaire in Appendix A and B.

The questionnaire was presented to 10 other owners, where it gained acceptance satisfactorily and was easy to answer in a period not exceeding 15 minutes. Then the questionnaire was sent by post mail to 30 respondents to answer it and return by any suitable means. Thirty questionnaires were received back, of which eight questionnaires contained incomplete answers. The participants who did not complete the questionnaire were contacted to answer the questions they missed by telephone and fax.

As such, significant and influential pilot tests were carried out before the distribution of the final questionnaire. Data from thirty questionnaires were entered into the program SPSS to carry out the test of the reliability. Cronbach's coefficient alpha of each was above 0.70; that was sufficient for internal consistent reliability of social science research. Next table 4.12 describes the reliability analysis.



*Table 4.12*  
*Reliability Analysis*

<i>Variables Name</i>	<i>Cronbach's Alpha</i>	<i>N of Items</i>
Owner's attitude	.861	4
Owner's innovativeness	.737	11
Relative advantage	.767	4
Compatibility	.748	3
Complexity	.747	4
Information intensity	.724	3
Competition intensity	.856	3
e-commerce adoption	.946	7
Power distance	.773	6
Uncertainty avoidance	.815	6
Individualism/Collectivism	.711	6
Masculinity/Femininity	.863	4

According to Sekaran (2006) in a normal mail survey the response rate of 30 percent is acceptable. Therefore, questionnaires were sent to 1150 SME owners in order to reach this target. In addition, as the sample frame consists of a large number of SMEs among geographical areas that are distributed in Saudi Arabia, the simple random sampling was drawn from the population to represent the sample size. The sample size was determined

in two stages. First, the particular sampling population and sampling frame were identified. In the second stage, the simple random sampling was used to draw the samples from each cluster.

There were several reasons for this. First, the list of the sampling frame covers a large geographical area, but face-to-face contact was not required because data were collected through postal questionnaires. Second, the sampling frame was divided into cluster and listed using firm numbers. Finally, the sample size of the study was relatively large and required to be the representative of the entire population, which cluster sampling works well with this condition.

The sampling frame contains a list of 78,488 SMEs. The list was divided into three areas. Since the population included less than 100,000, the sample needed to be a minimum of 382 participants in order to be representative of the population and for the results to be generalized (Sekaran, 2003). Next table 4.13 describes the guideline generalization regarding the sample size decision.

Table 4.13  
Sample Size Determination

<i>Population Size</i>	<i>Sample Size</i>
20000	377
30000	379
40000	380
50000	381
75000	382
100000<	384

*Source: Sekaran (2003)*

The data in this study were analysed using the SPSS statistical program. Various analyses were conducted, such as:

1. Factor analysis – To check the validity of the questionnaire, factor analysis tested whether the questions are in the right construct.
2. Reliability tests – Cronbach alpha was used due to most variables being of the multiple Likert type. Therefore, if the Cronbach alpha is 0.7 and above for all questions, then the questionnaire is good and reliable (Leech et al., 2005).
3. Normality test – This serves to check that the data collection is normally distributed. If the distribution is normal, then the researcher can use parametric testing.
4. Multiple regression – In an effort to test the hypotheses a series of multiple

regression will present for the significant factors. In addition, the regression models were used to indicate the various relationships of each variable. For further analysis, independent *t* tests and ANOVAs were used to examine differences in e-commerce among levels of socio demographic variables.

#### **4.3 Summary of the Chapter**

This chapter has discussed the methodology, including the design of the research and the strategy and method of research. To test the hypotheses, a descriptive design and a survey and the quantitative method have been used for its suitability to the current study.

In addition, the current study has included SMEs in Saudi Arabia listed by the General Organisation for Social Insurance (GOSI) in the three main areas of Riyadh, eastern Saudi Arabia, and Mecca, which are considered the largest areas geographically, demographically, and commercially. Therefore, the study used the list of SMEs in these areas as a framework from which to draw the sample. Since they involve a large number of populations, cluster and simple random sampling were drawn from the population to represent the appropriate sample. Further, pilot tests were carried out before the distribution of the final questionnaire, to make sure the questionnaire was well designed and reliable. Next chapter will present the results of the data analysis and results.

## **CHAPTER FIVE: DATA ANALYSIS AND RESULTS**

### **5.0 Introduction**

Chapter 5 will present the results of the data analysis. This chapter is organised in the following manner. First, the characteristics of the sample are presented. Next, the results of the factor analyses will be presented. Based on the factor analyses, certain items were removed from further analyses. The factor analyses will be followed by an analysis of the internal consistency reliability of the remaining items. Following the reliability analyses, descriptive statistics of the scale scores are presented. Next, each hypothesis is addressed in turn beginning with a correlational analysis of scales, but focusing mainly on the use of multiple regression. Finally, independent *t* tests and ANOVAs were used to examine differences in e-commerce among levels of socio demographic variables.

### **5.1 Sample Characteristics**

Participants in this study were randomly selected from the population of SME owners in the following three main areas in Saudi Arabia; Riyadh, Eastern Saudi Arabia, and Mecca. The final sample consisted of  $N = 400$  participants who successfully completed and returned the questionnaire. Table 5.1 presents the frequencies and percentages of the

different numbers of employees reported by the participants. Figure 5.1 presents the percentages in graphical form.

*Table 5.1*  
*Frequencies and Percentages for Number of Employees (N = 400)*

Number of employees	Frequency	Percent
1-25	156	39.00
26-50	102	25.50
51-100	46	11.50
101-150	29	7.25
151-250	67	16.75

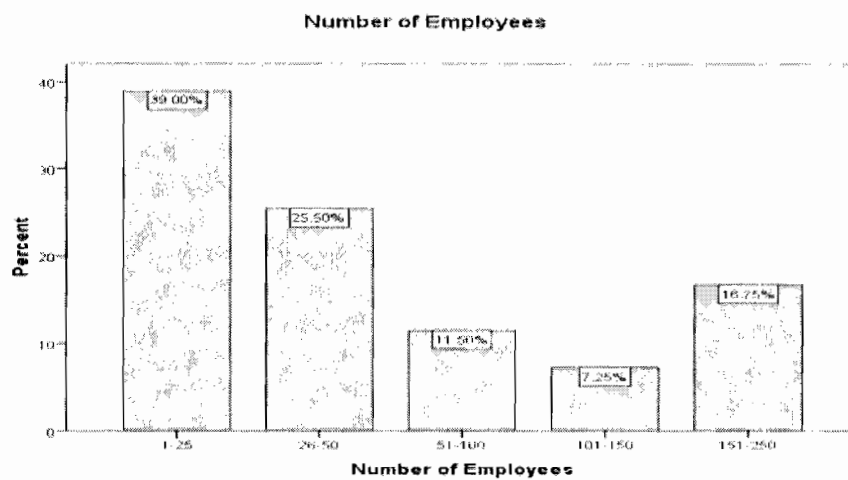


Figure 5.1  
Percentages of Number of Employees

Table 5.2 and Figure 5.2 present the frequencies and percentages of the different locations. These percentages truly reflect the composition of the population.

*Table 5.2*  
*Frequencies and Percentages for Location (N=400)*

	<i>Frequency</i>	<i>Percent</i>
Location		
Riyadh	176	44.00
Eastern	132	33.00
Mecca	92	23.00

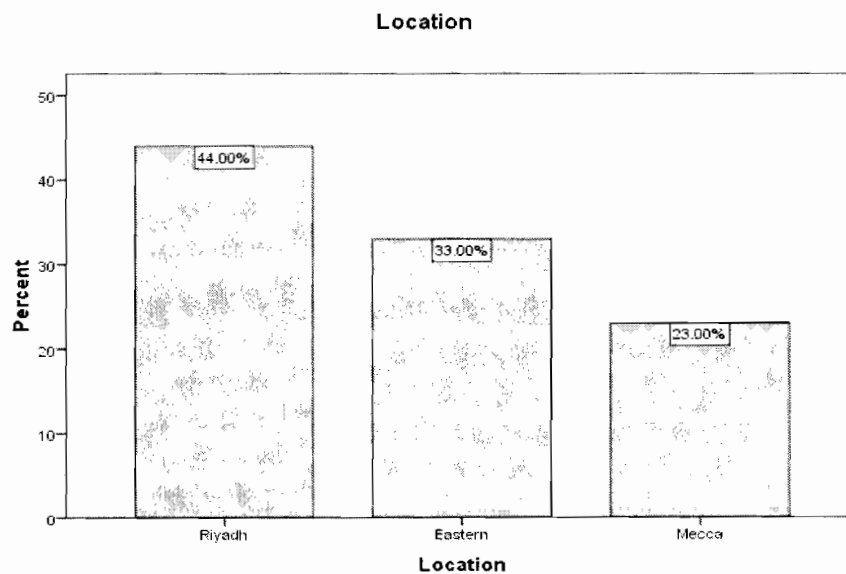
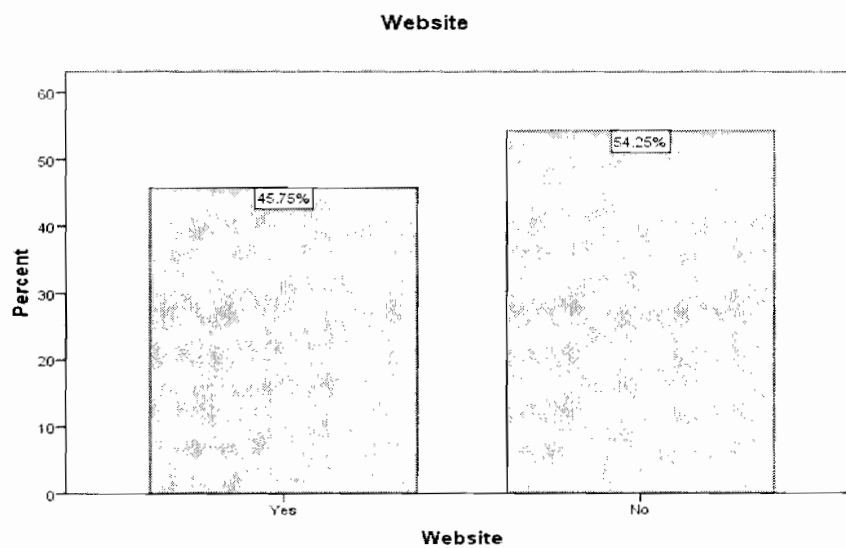


Figure 5.2  
Percentages of participants from different locations

Table 5.3 and Figure 5.3 present the frequencies and percentages of the participants whose companies had Web sites. A little less than half (45.75%) of the companies had Web sites.

*Table 5.3*  
*Frequencies and Percentages for Web Site (N = 400)*

	<i>Frequency</i>	<i>Percent</i>
Web site		
Yes	183	45.75
No	217	54.25



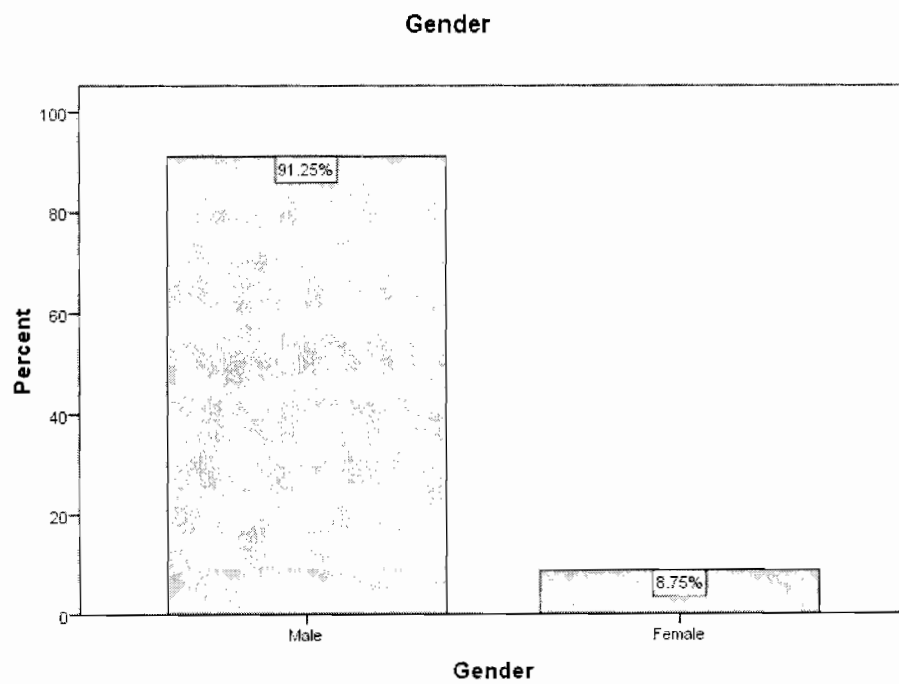
**Figure 5.3**  
**Percentages of Participants Whose Firm Had a Web Site**



Table 5.4 and Figure 5.4 present the frequencies and percentages for gender. Most of the SME owners in the sample were male (91.25%).

*Table 5.4*  
*Frequencies and Percentages for Gender (N = 400)*

	<i>Frequency</i>	<i>Percent</i>
Gender		
Male	365	91.25
Female	35	8.75

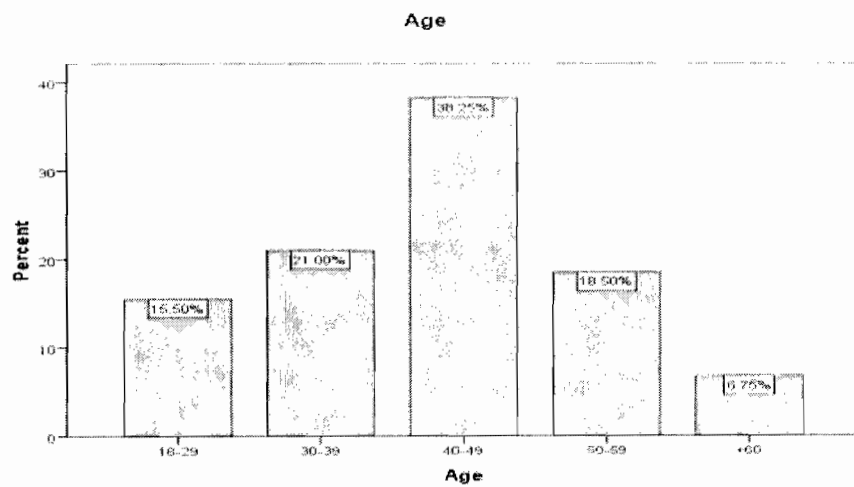


**Figure 5.4**  
**Percentages of Participants by Gender**

Table 5.5 and Figure 5.5 present the frequencies and percentages for age. The largest age group of SME owners in the sample was the 40-49 year old group (38.12%).

*Table 5.5*  
*Frequencies and Percentages for Age (N = 400)*

<i>Age</i>	<i>Frequency</i>	<i>Percent</i>
18-29	62	15.50
30-39	84	21.00
40-49	153	38.25
50-59	74	18.50
60	27	6.75



**Figure 5.5**  
**Percentages of Participants in Different Age Groups**

Table 5.6 and Figure 5.6 present the frequencies and percentages for education.

The largest educational group had Associate's degrees (48.00%).

*Table 5.6*  
*Frequencies and Percentages for Education (N = 400)*

	<i>Frequency</i>	<i>Percent</i>
Education		
Below high school	32	8.00
High school	52	13.00
Associate	192	48.00
Bachelor	96	24.00
Master	22	5.50
Doctorate	6	1.50

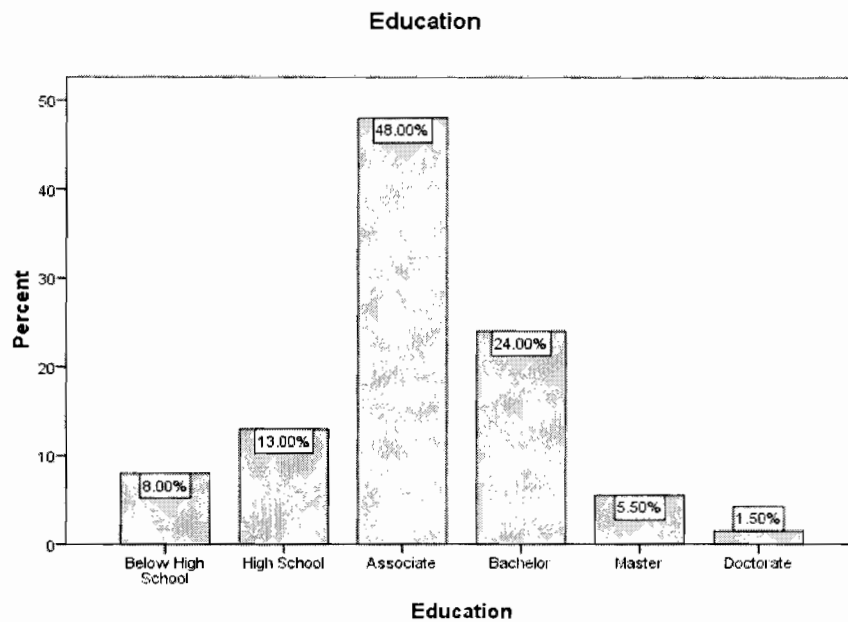


Figure 5.6  
Percentages of Participants at Different Levels of Education

Table 5.7 and Figure 5.7 present the frequencies and percentages for years of owner's tenure.

Table 5.7  
*Frequencies and Percentages for Owner's Tenure (N = 400)*

<i>Owner's tenure</i>	<i>Frequency</i>	<i>Percent</i>
1-5 years	100	25.00
6-10 years	91	22.75
11-15 years	64	16.00

16-20 years	55	13.75
21 years	90	22.50

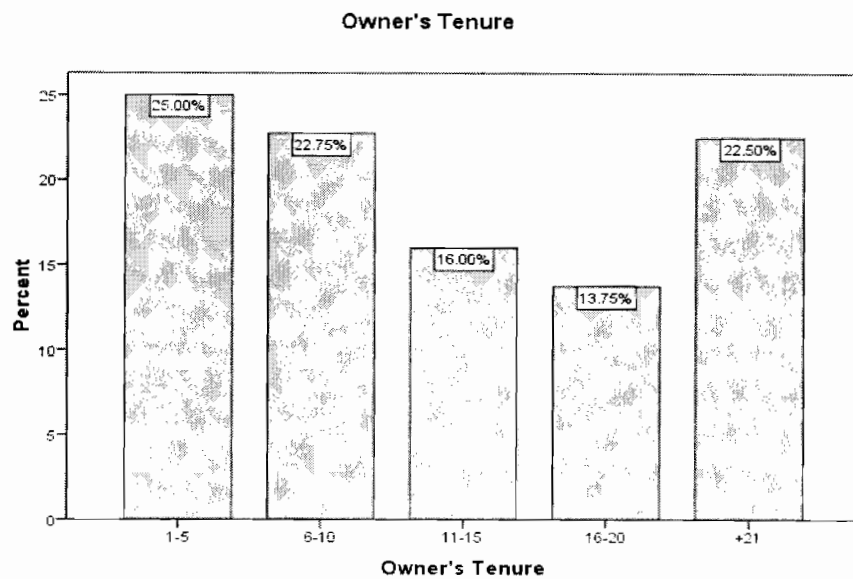


Figure 5.7  
Percentages of Different Groups of Owner's Tenure 5.2 Response Rate

A total of 1150 questionnaires were sent to SME owners on February 5th, 2010 and 207 questionnaires were returned after two weeks. Direct phone calls, as a reminder of a response that delayed in responding were made to increase the response rate (Sekaran, 2006). 145 responses were received by March 10th. Another reminder was placed on March 11th. By March 29th, 71 more responses were received. Finally, a total of 423 questionnaires were received. Out of these, 400 questionnaires were completed and usable giving a response rate of 34.78 percent. According to Sekaran (2006) this rate is

acceptable. Table 5.8 presents the response rate and the questionnaires.

*Table 5.8.*  
*Response Rate of the Questionnaires*

<i>Response</i>	<i>Frequency/Rate</i>
Number of distributed questionnaires	1150
First returned and usable questionnaires	200
Second returned and usable questionnaires	138
Third returned and usable questionnaires	62
Total returned and usable questionnaires	400
Response rate	34.78 %

As can be seen in Table 5.8, the return completed questionnaires were more than the minimum number (382). Therefore, this response rate is considered excellent according to Sekaran (2006).

### **5.3 Exploratory Factor Analysis**

The scales chosen for the current study had been previously factor analysed to determine their factor structures. Factor analysis was repeated in the current study to examine whether the factor structure held in the current sample, and also as a measure of

construct validity. Separate factor analyses were conducted for items that came from different instruments. The first instrument came from Seyal and Rahman (2003) for the measures of Attitude, Relative Advantage, Complexity, and Compatibility. Principal axis factoring was applied to the 16 items.

The Eigen value greater than 1.0 rule was used to determine the number of factors, and a direct oblimin rotation was applied. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test were computed prior to the factor analysis. The KMO test should ideally be greater than .70, but .60 is considered acceptable (Hair et al., 2006). In addition, Bartlett's test should be significant ( $p < .05$ ). For the Seyal and Rahman items, KMO = .736 and Bartlett's test was significant,  $\chi^2(105) = 2799.09$ ,  $p < .001$ . The factor loadings are presented in Table 5.9 in order of magnitude.

*Table 5.9*  
*Factor Loadings for Seyal and Rahman (2003) Items*

	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>
Relative advantage 3	.827			
Relative advantage 1	.784			
Relative advantage 4	.698			
Relative advantage 2	.637			
Complexity 4		.859		

Complexity 3	.787	
Complexity 2	.771	
Complexity 1	.616	
Compatibility 2		.825
Compatibility 1		.768
Compatibility 3		.725
Attitude 3		.729
Attitude 1		.676
Attitude 4		.660
Attitude 2		.559

As can be seen in Table 5.9, four factors were identified, and the items all loaded on the correct factors. Loadings should be at least .30 to be considered acceptable (Hair et al., 2006). All of the loadings were at least .56; thus, all of the items from the Seyal and Rahman instrument were retained for subsequent analyses.

The second factor analysis was computed on the items from Thong and Yap (1995) for the Information Intensity and Competition Intensity scales. For the Thong and Yap items, KMO = .670 and Bartlett's test was significant,  $\chi^2(15) = 511.77$ ,  $p < .001$ . The factor loadings are presented in Table 5.10 in order of magnitude.



*Table 5.10*  
*Factor Loadings for Thong and Yap (1995) Items*

	<i>Factor 1</i>	<i>Factor 2</i>
Information intensity 2	.863	
Information intensity 3	.744	
Information intensity 1	.616	
Competition intensity 2		.825
Competition intensity 1		.442
Competition intensity 3		.423

As can be seen in Table 5.10, two factors were identified and the items all loaded on the correct factors. All of the loadings were at least .42; thus, all of the items from the Thong and Yap instrument were retained for subsequent analyses.

The third factor analysis was computed on the items from Dorfman and Howell (1988) for the Power Distance, Uncertainty Avoidance, Individualism/Collectivism, and Masculinity/Femininity scales. For the Dorfman and Howell items, KMO = .692 and Bartlett's test was significant,  $\chi^2(231) = 5308.46$ ,  $p < .001$ . The factor loadings are presented in Table 5.11 in order of magnitude. As can be seen in Table 5.11, four factors were identified, and almost all of the items loaded on their respective factors, but there were a few problematic items. Uncertainty Avoidance item #6 loaded on the

Masculinity/Femininity scale rather than on the Uncertainty scale. This item stated, “Meetings are usually run more effectively when they are chaired by a man”; thus, it made sense that it loaded with masculinity. This item was removed from subsequent analyses. Power Distance item #2 (“It is frequently necessary for a manager to use authority and power when dealing with subordinates”) loaded on the correct factor, but the loading was only .288; thus, this item was also removed from subsequent analyses.

*Table 5.11*  
*Factor Loadings for Dorfman and Howell (1988) Item*

	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>
Individualism 2	.827			
Individualism 5	.693			
Individualism 1	.641			
Individualism 3	.618			
Individualism 6	.568			
Individualism 4	.377			
Masculinity 2		.895		
Masculinity 4		.884		
Masculinity 1		.685		
Masculinity 3		.652		
<b>Uncertainty 6</b>		<b>.322</b>		

Power distance 3	.822	
Power distance 4	.799	
Power distance 5	.776	
Power distance 1	.684	
Power distance 6	.652	
<b>Power distance 2</b>	<b>.288</b>	
Uncertainty 4		.881
Uncertainty 5		.796
Uncertainty 3		.700
Uncertainty 2		.540
Uncertainty 1		.368

---

*Note.* Bold items did not load sufficiently on the correct factor and were removed.

One final item (Uncertainty Avoidance item #1: “It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do”) had a higher loading on the Individualism scale (.531) than it had on the Uncertainty scale (.368); however, because its loading on the appropriate scale was greater than .30, it was retained on the Uncertainty Avoidance scale.

The fourth factor analysis was computed on the Innovativeness items to determine whether a one-factor structure was appropriate for these 11 items. Five of the items were worded in the positive direction such that greater agreement indicated greater innovativeness. The other six items were negatively worded such that greater agreement indicated less innovativeness; thus, those six items were reverse-keyed so that a rating of 1 became 5, 2 became 4, 3 stayed the same, 4 became 2, and 5 became 1. For the Innovativeness items, KMO = .716 and Bartlett's test was significant,  $\chi^2(55) = 1417.57$ ,  $p < .001$ . The analysis was set to produce only one factor. The factor loadings are presented in Table 5.12 in order of magnitude. As can be seen in Table 5.12, six of the items had acceptable loadings on the factor, but the other five items did not have acceptable loadings. Note that this was also true when the first six items were not reverse-keyed. Since the last five items did not load acceptably on the Innovativeness factor (and also because the reliability was better without them), those five items were removed from subsequent analyses.

*Table 5.12*  
*Factor Loadings for Innovativeness Items*

	Factor 1
Innovativeness 2 (R)	.667
Innovativeness 4 (R)	.834

Innovativeness 5 (R)	.757
Innovativeness 7 (R)	.730
Innovativeness 8 (R)	.713
Innovativeness 9 (R)	.430
<b>Innovativeness 1</b>	<b>.189</b>
<b>Innovativeness 3</b>	<b>-.182</b>
<b>Innovativeness 6</b>	<b>.061</b>
<b>Innovativeness 10</b>	<b>-.103</b>
<b>Innovativeness 11</b>	<b>.090</b>

*Note. (R) = Reverse-keyed. Bold items did not load sufficiently on the correct factor and were removed.*

The final factor analysis was computed on the e-commerce (B2C) items to determine whether a one-factor structure was appropriate for these seven items. For the e-commerce items, KMO = .810 and Bartlett's test was significant,  $\chi^2(21) = 2330.75$ ,  $p < .001$ . The analysis was set to produce only one factor. The factor loadings are presented in Table 5.13 in order of magnitude. As can be seen in Table 5.13, all of the loadings were at least .50; thus, all of the items from the e-commerce (B2C) scale were retained for subsequent analyses.

*Table 5.13*  
*Factor Loadings for e-commerce Items*

	<i>Factor 1</i>
E-commerce3	.927
E-commerce2	.882
E-commerce4	.812
E-commerce1	.777
E-commerce5	.775
E-commerce7	.593
E-commerce6	.500

#### **5.4 Reliability Analysis**

Table 5.14 presents the Cronbach's alpha reliabilities that were computed to assess the internal consistency of the items that were retained after the factor analyses of each of the scales (Pallant, 2005). Cronbach's alpha reliabilities should be greater than .70 in order to be considered acceptable, but scales are often accepted if the reliability is at least .60. Only the reliability for the Competition Intensity scale score was below .70 ( $\alpha$

= .56). The idea of eliminating the scale was entertained; however, subsequent analyses indicated that despite its lower reliability, it was one of the best predictors of e-commerce. Thus, the scale was retained for further analyses.

*Table 5.14*  
*Cronbach's Alpha Reliabilities for Scales (N = 400)*

	<i>Number of items</i>	<i>Reliability (<math>\alpha</math>)</i>
E-commerce	7	.90
Attitude	4	.74
Innovativeness	6	.84
Relative advantage	4	.82
Compatibility	3	.81
Complexity	4	.84
Information intensity	3	.78
Competition intensity	3	.56
Power distance	5	.86
Uncertainty avoidance	5	.82
Individualism/collectivism	6	.76
Masculinity/femininity	4	.86

### **5.5 Descriptive Statistics and Assessment of Normality**

Scale scores were computed for the retained items by averaging the items that belonged to each scale. Table 5.15 presents descriptive statistics for each of the scales mentioned above. To assess normality of each scale, measures of skewness and kurtosis were computed. Skewness and kurtosis values of zero are indicative of a normal distribution, and values between -2 and +2 signify no problematic deviations from normality (Balanda & MacGillivray, 1988; De Carlo, 1997; Groeneveld & Meeden, 1984; Hopkins & Weeks, 1990; Kendall, Stuart, Ord, & Arnold, 1999). All measures of skewness and kurtosis were between the values of -2 and +2.



*Table 5.15*  
*Descriptive Statistics for Scales*

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>Skewness</i>	<i>Kurtosis</i>
E-commerce	400	2.37	1.47	1.00 – 5.00	0.74	-0.88
Size of firm	400	4.37	0.53	2.75 – 5.00	-0.89	0.63
Attitude	400	3.02	0.90	1.33 – 5.00	0.33	-0.40
Innovativeness	400	6.60	2.48	1.00 – 5.00	-0.74	-0.68
Knowledge	400	4.30	0.57	3.00 – 9.00	-0.34	-0.84
Relative advantage	400	3.87	0.74	1.33 – 5.00	-0.90	1.64
Compatibility	400	3.59	0.80	1.50 – 5.00	-0.19	-0.32
Complexity	400	4.20	0.63	2.00 – 5.00	-1.16	1.60
Information intensity	400	3.74	0.65	2.00 – 5.00	0.09	-0.54
Competition intensity	400	2.56	0.98	1.00 – 5.00	0.40	-0.30
Power distance	400	4.46	0.51	2.00 – 5.00	-1.10	1.91
Uncertainty avoidance	400	4.16	0.63	2.00 – 5.00	-0.97	1.10
Individualism	400	3.36	0.94	1.25 – 5.00	-0.16	-0.76
Masculinity	400	2.37	1.473	1.00 – 5.00	0.74	-0.88

## 5.6 Tests of Hypotheses

Before presenting and testing the hypotheses with multiple regressions, Pearson Product Moment Correlation Coefficients were computed between the e-commerce adoption and each of the independent and moderator variables. Table 5.16 presents these correlations. As can be seen in Table 5.16, when considering the independent and moderator variables individually, the variables that showed significant relations with e-commerce were Competition Intensity ( $r = .29, p < .001$ ), Information Intensity ( $r = .28, p < .001$ ), Size of firm ( $r = .19, p < .001$ ), Attitude ( $r = .17, p < .001$ ), and Innovativeness ( $r = .11, p < .001$ ). Each of these variables was positively related to e-commerce adoption such that increases in those variables were related to a greater e-commerce adoption.

*Table 5.16*  
*Correlations Between e-commerce and Other Scales*

	E-commerce
Size of firm	.19***
Attitude	.17***
Innovativeness	.11*
Knowledge	.02
Relative advantage	-.07
Compatibility	.03

Complexity	-.05
Information intensity	.28***
Competition intensity	.29***
Power distance	.07
Uncertainty avoidance	.06
Individualism	.04
Masculinity	.04

\* $p < .05$ . \*\*\* $p < .001$ .

The first nine hypotheses were as follows:

**Hypothesis (1):** There is a significant relationship between the firm size and the e-commerce adoption.

**Hypothesis (2):** There is a significant relationship between the owner's attitudes and the e-commerce adoption.

**Hypothesis (3):** There is a significant relationship between the owner's innovativeness and the e-commerce adoption.

**Hypothesis (4):** There is a significant relationship between the owner's technology knowledge and the e-commerce adoption.

**Hypothesis (5):** There is a significant relationship between the relative advantage and the e-commerce adoption.

**Hypothesis (6):** There is a significant relationship between the compatibility and the e-commerce adoption.

**Hypothesis (7):** There is a significant relationship between the complexity and the e-commerce adoption.

**Hypothesis (8):** There is a significant relationship between information intensity and the e-commerce adoption.

**Hypothesis (9):** There is a significant relationship between the competitors' intensity and the e-commerce adoption.

Hypotheses H1 – H9 were assessed by computing a multiple regression in which the e-commerce adoption (B2C) was regressed simultaneously on the nine independent

variables listed above:  $B2C = B0 + B1 \cdot \text{Size of firm} + B2 \cdot \text{Attitude} + B3 \cdot \text{Innovativeness} + B4 \cdot \text{Knowledge} + B5 \cdot \text{Relative Advantage} + B6 \cdot \text{Compatibility} + B7 \cdot \text{Complexity} + B8 \cdot \text{Information Intensity} + B9 \cdot \text{Competition Intensity} + e$ .

The regression model and all other subsequent regression models were first assessed to determine whether they met the necessary assumptions of multiple regression (Cohen et al., 2003). First, the variables were assessed to be sufficiently and normally distributed as discussed earlier in the section on skewness and kurtosis (See Table 5.15). Second, a linear relationship was determined between the independent and dependent variables by plotting the studentised residuals against the standardised predicted values of the dependent variable for each regression. Figure 5.8 displays a scatter plot showing this relationship for the first regression. As can be seen in the scatter plot, there were no obvious curvilinear patterns in the data; thus, a linear relationship could be assumed. The same was true for all subsequent scatter plots; thus, they are not shown. Third, the variables were previously determined to be measured reliably as presented in Table 5.14. Fourth, Figure 5.8 can also be used to assess the data for homoscedasticity, which is a measure of whether the error variances are equal across all levels of the independent variables. When error variances are not equal, obvious patterns (e.g., bowtie pattern, fan pattern) will appear in the scatter plot, indicating heteroscedasticity. The plot in Figure 5.8 is sufficiently free of patterns, thus indicating that the assumption of

homoscedasticity has been met. Finally, the independent variables were assessed for multicollinearity. Typical measures of multicollinearity include the Tolerance and the Variance Inflation Factor (VIF). Typically, tolerance measures should be  $> .20$  and the VIF should be  $< 4.0$ . All independent variables in all regression models met these assumptions; thus, they will not be mentioned again.

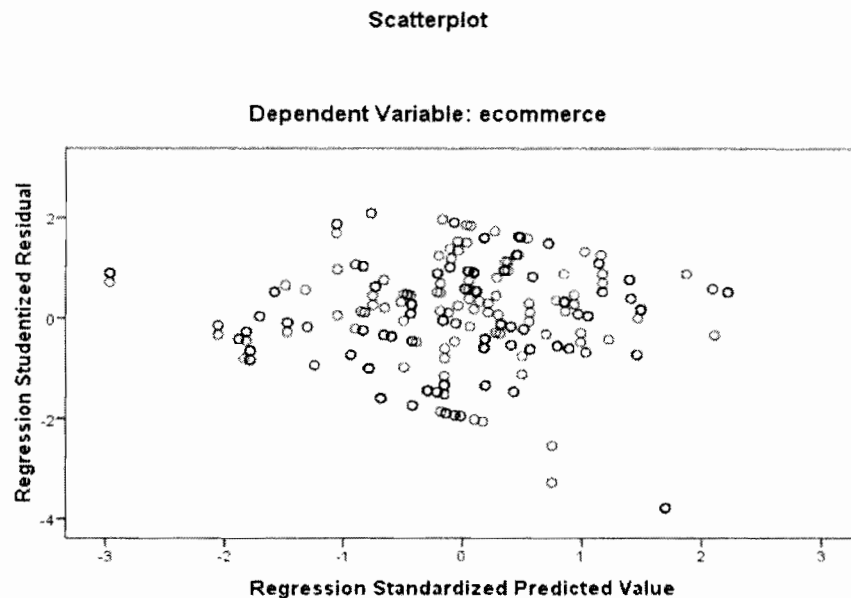


Figure 5.8  
Scatterplot of Standardised Residuals and Standardised Predicted Values for Regression for Testing Hypotheses 1–9

The results for the first regression model for testing Hypotheses 1–9 are presented in Table 5.17. The overall model was significant,  $F(9, 388) = 12.07$ ,  $p < .001$ , explaining

21.9% of the variance in e-commerce adoption. When all nine independent variables were considered simultaneously in the regression model, the four variables that had the strongest positive significant correlations with e-commerce remained significant: Attitude ( $\beta = .27$ ,  $p < .001$ ), Competition Intensity ( $\beta = .23$ ,  $p < .001$ ), Information Intensity ( $\beta = .20$ ,  $p < .001$ ), and Size of firm ( $\beta = .16$ ,  $p < .001$ ). Innovativeness, which had a significant positive correlation with e-commerce, was no longer a significant predictor; however, two of the other variables became significant negative predictors when considering all variables simultaneously: Relative Advantage ( $\beta = -.24$ ,  $p < .001$ ) and Knowledge ( $\beta = -.12$ ,  $p < .05$ ).

*Table 5.17*  
*Regression Model for Predicting e-commerce from all Independent Variables (Hypotheses 1–9)*

Predictors	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>	
Size of firm	0.10	0.03	.16***	3.51	.000	.219
Attitude	0.44	0.10	.27***	4.53	.000	
Innovativeness	0.07	0.05	.07	1.40	.162	
Knowledge	-0.04	0.02	-.12*	-2.21	.028	
Relative advantage	-0.37	0.09	-.24***	-4.11	.000	
Compatibility	0.04	0.06	.04	.75	.456	
Complexity	0.01	0.05	.01	.13	.894	

Information intensity	0.28	0.07	.20***	3.98	.000
Competition intensity	0.31	0.06	.23***	4.78	.000

*Note.* The overall model was significant,  $F(9, 388) = 12.07, p < .001$ . The constant for the model = 0.50. \* $p < .05$ . \*\*\* $p < .001$ .

Thus, higher levels of Attitude, Competition Intensity, Information Intensity, and Size of firm were related to higher e-commerce, whereas higher levels of Relative Advantage and Knowledge were related to lower e-commerce. The results of the regression analysis provided support for Hypothesis 1 (Size of firm), Hypothesis 2 (Attitude), Hypothesis 4 (Knowledge), Hypothesis 5 (Relative Advantage), Hypothesis 8 (Information Intensity), and Hypothesis 9 (Competition Intensity). The analysis did not support Hypothesis 3 (Innovativeness), Hypothesis 6 (Compatibility), or Hypothesis 7 (Complexity).

**Hypothesis (10):** Power distance moderates the relationship of the organisational context with the e-commerce adoption among SMEs. Hypothesis 10 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Size\ of\ firm + B2*Attitude + B3*Innovativeness + B4*Knowledge + B5*Power\ Distance + B6*Size*Power\ Distance + B7*Attitude*Power\ Distance + B8*Innovativeness*Power\ Distance + B9*Knowledge*Power\ Distance + e$ . Size of firm, Attitude, Innovativeness, and Knowledge were the four measures of organisational context; thus, they were each included in the regression, and an interaction term was computed between each of the



measures of organisational context and Power Distance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.18 presents the results of the multiple regression. The overall model was significant,  $F(9, 388) = 5.11, p < .001$ , explaining 10.6% of the variance in e-commerce.

When the four independent variables from the organisational context, power distance, and their interactions were considered simultaneously in the regression model, four of the non-interaction terms were positive significant predictors of e-commerce: Attitude ( $\beta = .21, p < .001$ ), Innovativeness ( $\beta = .18, p < .01$ ), Power Distance ( $\beta = .18, p < .01$ ), and Size of firm ( $\beta = .14, p < .01$ ), indicating that as any of those variables increased, so did the e-commerce adoption. One of the interaction terms was significant as well: Power Distance  $\times$  Size ( $\beta = .12, p < .05$ ). This means that the relation between size of firm and e-commerce adoption was different depending on the level of Power Distance a firm had. Thus, Hypothesis 10 was supported for the organisational context variable size of firm such that Power Distance moderated the relation between size and e-commerce, but did not moderate the relation between the other organisational variables and e-commerce.

Table 5.18

*Regression Model for Predicting e-commerce from Organisational and Power Distance and Their Interactions (Hypothesis 10)*

Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>	
Size of firm	0.13	0.05	.14**	2.77	.006	.106
Attitude	0.19	0.05	.21***	3.64	.000	
Knowledge	-0.05	0.05	-.06	-1.08	.280	
Innovativeness	0.15	0.06	.18**	2.83	.005	
Power distance (PD)	0.16	0.05	.18**	3.08	.002	
PD × Size	0.11	0.04	.12*	2.38	.018	
PD × Attitude	-0.04	0.06	-.04	-0.66	.507	
PD × Knowledge	0.01	0.07	.01	0.17	.865	
PD × Innovativeness	-0.00	0.05	-.00	-0.04	.968	

*Note.* The overall model was significant,  $F(9, 388) = 5.11, p < .001$ . The constant for the model = 3.55. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.9 illustrates the significant interaction between Power Distance and Size of Firm. The figure was created by entering values into the regression equation for Hypothesis 10 of +1 for High Power Distance, -1 for Low Power Distance, +1 for High Firm Size, and -1 for Low Firm Size. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.9 that Size of Firm does not matter much for e-commerce adoption when Power Distance is

low, but when Power Distance is high, large firms have much higher e-commerce adoption than small firms.

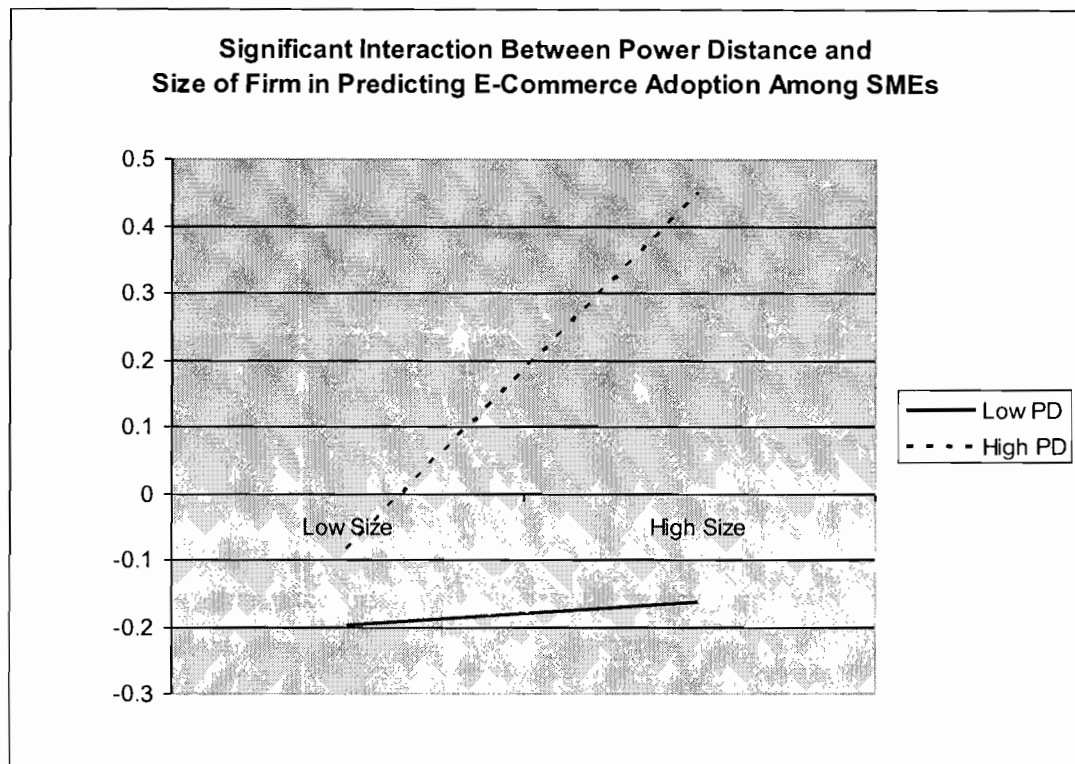


Figure 5.9  
Significant Interaction Between Power Distance and Size of Firm in Predicting e-commerce Adoption Among SMEs

**Hypothesis (11):** Power distance moderates the relationship of the technology context with the e-commerce adoption among SMEs. Hypothesis 11 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1 \cdot \text{Relative}$

$$\text{Advantage} + B2*\text{Compatibility} + B3*\text{Complexity} + B4*\text{Power Distance} + B5*\text{Relative Advantage} + B6*\text{Compatibility*Power Distance} + B7*\text{Complexity*Power Distance} + e.$$

Relative Advantage, Compatibility, and Complexity were the three measures of Technology context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of technology context and Power Distance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.19 presents the results of the multiple regression. The overall model was significant,  $F(7, 392) = 3.54, p < .001$ , explaining 6.0% of the variance in e-commerce. When the three independent variables from the technology context, power distance, and their interactions were considered simultaneously in the regression model, one of the non-interaction terms was a positive significant predictor of e-commerce: Compatibility ( $\beta = .21, p < .001$ ), indicating that as Compatibility increased, so did the e-commerce adoption. One of the non-interaction terms was a negative significant predictor of e-commerce: Relative Advantage ( $\beta = -.21, p < .001$ ), indicating that as Relative Advantage increased, the e-commerce adoption decreased. One of the interaction terms was significant as well: Power Distance  $\times$  Compatibility ( $\beta = -.23, p < .001$ ). This means that the relation between Compatibility and e-commerce adoption was different depending on the level of Power Distance a firm had. Thus, Hypothesis 11 was supported for the technology context variable

Compatibility such that Power Distance moderated the relation between Compatibility and e-commerce, but did not moderate the relation between e-commerce and the other technology variables.

*Table 5.19*  
*Regression Model for Predicting e-commerce from Technology and Power Distance and Their Interactions (Hypothesis 11)*

Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>	
Relative advantage	-0.18	0.06	-.21***	-3.36	.001	.060
Compatibility	0.18	0.06	.21***	3.27	.001	
Complexity	-0.01	0.05	-.01	-0.26	.796	
Power distance (PD)	0.00	0.05	.00	0.05	.960	
PD × Relative Advantage	0.10	0.05	.12	1.83	.067	
PD × Compatibility	-0.14	0.04	-.23***	-3.90	.000	
PD × Complexity	0.08	0.07	.07	1.17	.242	

*Note.* The overall model was significant,  $F(7, 392) = 3.54$ ,  $p < .001$ . The constant for the model = 3.53. \*\*\* $p < .001$ .

Figure 5.10 illustrates the significant interaction between Power Distance and Compatibility. The figure was created by entering values into the regression equation for Hypothesis 11 of +1 for High Power Distance, -1 for Low Power Distance, +1 for High Compatibility, and -1 for Low Compatibility. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.10 that Compatibility does not matter much for e-commerce adoption when Power Distance is high, but when Power Distance is low, firms with higher Compatibility scores have much higher e-commerce adoption than firms with low Compatibility scores.

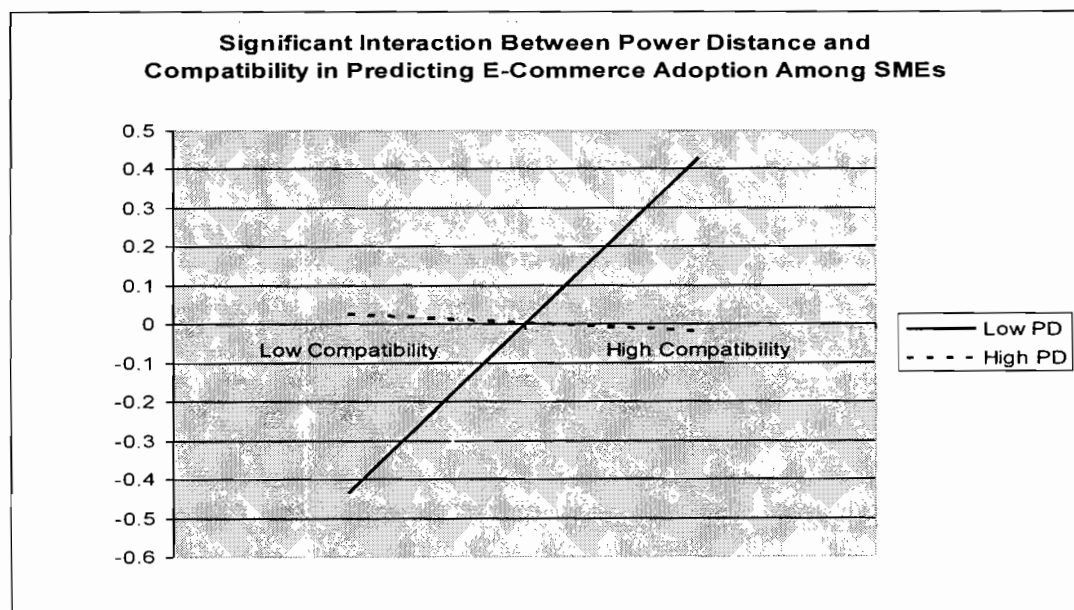


Figure 5.10  
Significant Interaction Between Power Distance and Compatibility in Predicting e-commerce Adoption Among SMEs

**Hypothesis (12):** Power distance moderates the relationship of the environmental context with the e-commerce adoption among SMEs. Hypothesis 12 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Information\ Intensity + B2*Competition\ Intensity + B3*Power\ Distance + B4*Information\ Intensity*Power\ Distance + B5*Competition\ Intensity*Power\ Distance + e$ . Information Intensity and Competition Intensity were the two measures of Environmental context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of Environmental context and Power Distance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.20 presents the results of the multiple regression. The overall model was significant,  $F(5, 394) = 16.96$ ,  $p < .001$ , explaining 17.7% of the variance in e-commerce. When the two independent variables from the environmental context, power distance, and their interactions were considered simultaneously in the regression model, all three of the non-interaction terms were positive significant predictors of e-commerce: Information Intensity ( $\beta = .25$ ,  $p < .001$ ), Competition Intensity ( $\beta = .23$ ,  $p < .001$ ), and Power Distance ( $\beta = .14$ ,  $p < .01$ ), indicating that as any of those variables increased, so did the e-commerce adoption. One of the interaction terms was significant as well: Power Distance  $\times$  Information Intensity ( $\beta = -.18$ ,  $p < .001$ ). This means that the relation between Information Intensity and e-commerce adoption was different depending on the

level of Power Distance a firm had. Thus, Hypothesis 12 was supported for the environmental context variable Information Intensity such that Power Distance moderated the relation between e-commerce and Information Intensity, but Power Distance did not moderate the relation between e-commerce and Competition Intensity.

*Table 5.20*  
*Regression Model for Predicting e-commerce from Environment and Power Distance and Their Interactions (Hypothesis 12)*

Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>	
Information intensity	0.22	0.04	.25***	5.19	.000	.177
Competition intensity	0.20	0.04	.23***	4.83	.000	
Power distance (PD)	0.13	0.04	.14**	3.02	.003	
PD x Information Intensity	-0.16	0.05	-.18***	-3.41	.001	
PD x Competition Intensity	-0.03	0.05	-.03	-.59	.554	

*Note.* The overall model was significant,  $F(5, 394) = 16.96$ ,  $p < .001$ . The constant for the model = 3.54. \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.11 illustrates the significant interaction between Power Distance and Information Intensity. The figure was created by entering values into the regression equation for Hypothesis 12 of +1 for High Power Distance, -1 for Low Power Distance, +1 for High Information Intensity, and -1 for Low Information Intensity. All other values were entered as 0 to hold them constant at the mean value for each variable. It



can be readily seen in Figure 3 that Information Intensity does not matter much for e-commerce adoption when Power Distance is high, but when Power Distance is low, firms with higher Information Intensity scores have much higher e-commerce adoption than firms with low Information Intensity scores.

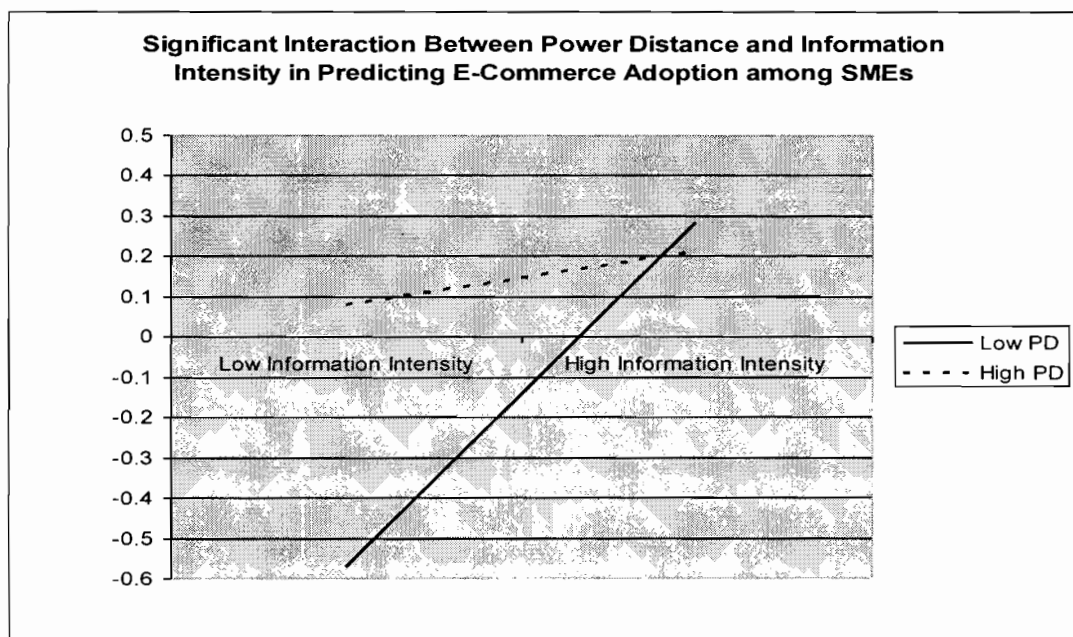


Figure 5.11  
Significant Interaction Between Power Distance and Information Intensity in Predicting e-commerce Adoption Among SMEs

**Hypothesis (13):** Uncertainty avoidance moderates the relationship of the organisational context with the e-commerce adoption among SMEs. Hypothesis 13 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1 * \text{Size of firm}$

$$+ B2*Attitude + B3*Innovativeness + B4*Knowledge + B5*Uncertainty Avoidance + B6*Size*Uncertainty Avoidance + B7*Attitude*Uncertainty Avoidance + B8*Innovativeness*Uncertainty Avoidance + B9*Knowledge*Uncertainty Avoidance + e.$$

Size of firm, Attitude, Innovativeness, and Knowledge were the four measures of organisational context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of organisational context and Uncertainty Avoidance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 21 presents the results of the multiple regression. The overall model was significant,  $F(9, 388) = 4.65$ ,  $p < .001$ , explaining 9.7% of the variance in e-commerce. When the four independent variables from the organisational context, Uncertainty Avoidance, and their interactions were considered simultaneously in the regression model, two of the non-interaction terms were positive significant predictors of e-commerce: Attitude ( $\beta = .24$ ,  $p < .001$ ) and Size of firm ( $\beta = .18$ ,  $p < .001$ ), indicating that as either of those variables increased, so did the e-commerce adoption. Two of the interaction terms were significant as well: Uncertainty Avoidance  $\times$  Knowledge ( $\beta = -.16$ ,  $p < .01$ ) and Uncertainty Avoidance  $\times$  Innovativeness ( $\beta = .13$ ,  $p < .05$ ). This means that the relation between Knowledge and e-commerce adoption and the relation between Innovativeness and e-commerce were different depending on the level of Uncertainty Avoidance a firm had. Thus, Hypothesis 13 was supported for the

organisational context such that Uncertainty Avoidance moderated the relation between Knowledge and e-commerce and between Innovativeness and e-commerce, but this moderation effect did not hold for the other organisational variables.

*Table 5.21*  
*Regression Model for Predicting e-commerce from Organisational and Uncertainty Avoidance and Their Interactions (Hypothesis 13)*

Predictors	<i>B</i>	<i>SE B</i>	<i> t </i>	<i>P</i>	<i>R</i> <sup>2</sup>	
Size of firm	0.16	0.04	.18***	3.52	.000	.097
Attitude	0.22	0.06	.24***	3.87	.000	
Knowledge	-0.09	0.05	-.10	-1.84	.066	
Innovativeness	0.06	0.05	.07	1.17	.244	
Uncertainty avoidance	-0.05	0.05	-.06	-1.04	.297	
(UA)						
UA × Size	-0.06	0.05	-.07	-1.36	.174	
UA × Attitude	0.02	0.04	.03	0.49	.627	
UA × Knowledge	-0.14	0.05	-.16**	-2.63	.009	
UA × Innovativeness	0.13	0.06	.13*	2.14	.033	

*Note.* The overall model was significant,  $F(9, 388) = 4.65, p < .001$ . The constant for the model = 3.55. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.12 illustrates the significant interaction between Uncertainty Avoidance and Knowledge. The figure was created by entering values into the regression equation for

Hypothesis 13 of +1 for High Uncertainty Avoidance, -1 for Low Uncertainty Avoidance, +1 for High Knowledge, and -1 for Low Knowledge. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.12 that Knowledge matters only a little bit when Uncertainty Avoidance is low, such that when Uncertainty Avoidance is low, e-commerce is only a little higher when Knowledge is higher. However, when Uncertainty Avoidance is high, firms with higher Knowledge scores have much *lower* e-commerce adoption than firms with low Knowledge scores.

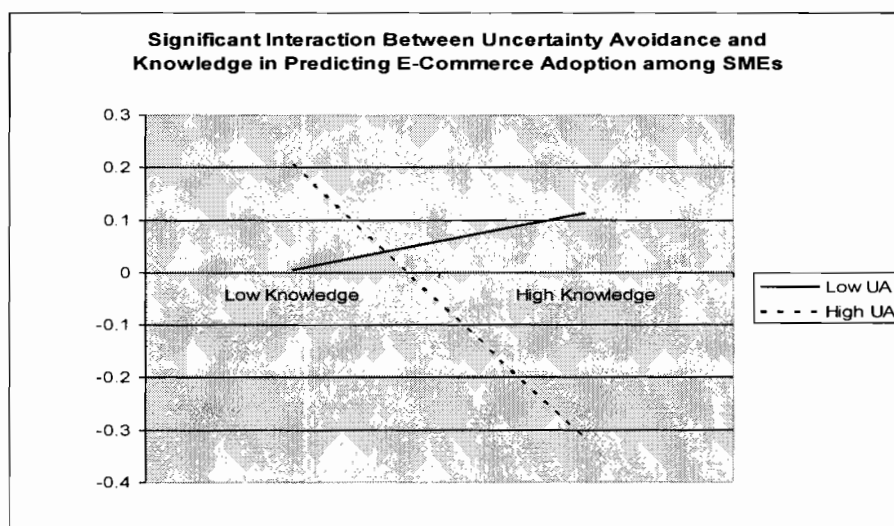


Figure 5.12  
Significant Interaction Between Uncertainty Avoidance and Knowledge in Predicting e-commerce Adoption Among SMEs

Figure 5.13 illustrates the significant interaction between Uncertainty Avoidance and Innovativeness. The figure was created by entering values into the regression equation

for Hypothesis 13 of +1 for High Uncertainty Avoidance, -1 for Low Uncertainty Avoidance, +1 for High Innovativeness, and -1 for Low Innovativeness. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.13 that when Uncertainty Avoidance is low, firms with lower Innovativeness scores have a higher e-commerce adoption than firms with higher Innovativeness scores. However, the opposite finding holds when Uncertainty Avoidance is high, such that firms with higher Innovativeness scores have much higher e-commerce adoption than firms with lower Innovativeness scores.

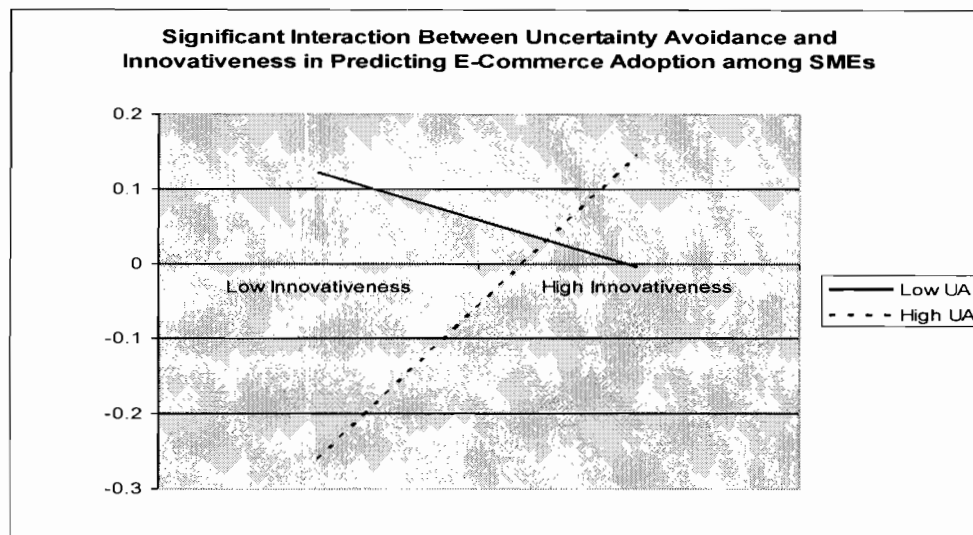


Figure 5.13  
Significant Interaction Between Uncertainty Avoidance and Innovativeness in Predicting e-commerce Adoption Among SMEs

**Hypothesis (14):** Uncertainty avoidance moderates the relationship of the technology context with the e-commerce adoption among SMEs. Hypothesis 14 was addressed by

computing a multiple regression with the following terms:  $B2C = B0 + B1*Relative Advantage + B2*Compatibility + B3*Complexity + B4* Uncertainty Avoidance + B5*Relative Advantage*Uncertainty Avoidance + B6*Compatibility*Uncertainty Avoidance + B7*Complexity*Uncertainty Avoidance + e$ . Relative Advantage, Compatibility, and Complexity were the three measures of technology context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of technology context and Uncertainty Avoidance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.22 presents the results of the multiple regression. The overall model was not significant,  $F(7, 392) = 1.44$ ,  $p > .05$ , explaining only 2.5% of the variance in e-commerce. When the three independent variables from the technology context, Uncertainty Avoidance, and their interactions were considered simultaneously in the regression model, one of the non-interaction terms was a positive significant predictor of e-commerce: Uncertainty Avoidance ( $\beta = .13$ ,  $p < .05$ ), indicating that as Uncertainty Avoidance increased, so did the e-commerce adoption. One of the non-interaction terms was a negative significant predictor of e-commerce: Relative Advantage ( $\beta = -.16$ ,  $p < .001$ ), indicating that as Relative Advantage increased, the e-commerce adoption decreased. None of the interaction terms was significant. Thus, Hypothesis 14 was not supported for the technology context because Uncertainty Avoidance did not interact with any of the

technology variables in predicting the e-commerce adoption. In other words, Uncertainty Avoidance did not moderate the relation between technology and e-commerce.

*Table 5.22*  
*Regression Model for Predicting e-commerce From Technology and Uncertainty Avoidance and Their Interactions (Hypothesis 14)*

Predictors	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>	
Relative advantage	-0.14	0.06	-.16*	-2.51	.012	.025
Compatibility	0.06	0.05	.07	1.22	.221	
Complexity	-0.03	0.05	-.03	-0.63	.529	
Uncertainty avoidance (UA)	0.11	0.06	.13*	2.06	.040	
UA × Relative Advantage	-0.02	0.04	-.02	-0.38	.706	
UA × Compatibility	-0.00	0.06	-.00	-0.05	.959	
UA × Complexity	-0.04	0.05	-.04	-0.78	.437	

*Note.* The overall model was not significant,  $F(7, 392) = 1.44, p > .05$ . The constant for the model = 3.56. \* $p < .05$ .

**Hypothesis (15):** Uncertainty avoidance moderates the relationship of the environmental context with the e-commerce adoption among SMEs. Hypothesis 15 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Information\ Intensity + B2*Competition\ Intensity + B3*Uncertainty\ Avoidance + B4*Information\ Intensity*Uncertainty\ Avoidance + B5*Competition\ Intensity*Uncertainty\ Avoidance + e$ . Information Intensity and Competition Intensity were the two measures of environmental context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of environmental context and Uncertainty Avoidance. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.23 presents the results of the multiple regression. The overall model was significant,  $F(5, 394) = 14.10, p < .001$ , explaining 15.2% of the variance in e-commerce. When the two independent variables from the environmental context, Uncertainty Avoidance, and their interactions were considered simultaneously in the regression model, two of the non-interaction terms were positive significant predictors of e-commerce: Information Intensity ( $\beta = .26, p < .001$ ) and Competition Intensity ( $\beta = .20, p < .001$ ), indicating that as either of those variables increased, so did the e-commerce adoption. Both of the interaction terms were significant as well: Uncertainty Avoidance  $\times$  Information Intensity ( $\beta = .12, p < .05$ ) and Uncertainty Avoidance  $\times$  Competition Intensity ( $\beta = -.13, p < .01$ ). This means that the relation between



Information Intensity and e-commerce adoption and the relation between Competition Intensity and e-commerce were different depending on the level of Uncertainty Avoidance a firm had. Thus, Hypothesis 15 was supported for both environmental context variables: Information Intensity and Competition Intensity such that Uncertainty Avoidance moderated the relation between the two environmental variables and e-commerce.

*Table 5.23*  
*Regression Model for Predicting E-commerce from Environment and Uncertainty Avoidance and Their Interactions (Hypothesis 15)*

Predictors	<i>B</i>	<i>SE B</i>	<i>Et</i>	<i>P</i>	<i>R</i> <sup>2</sup>	
Information intensity	0.23	0.04	.26***	5.183	.000	.152
Competition intensity	0.18	0.04	.20***	4.042	.000	
Uncertainty avoidance (UA)	0.02	0.04	.02	0.374	.709	
UA x Information Intensity	0.11	0.04	.12*	2.354	.019	
UA x Competition Intensity	-0.12	0.04	-.13**	-2.741	.006	

*Note.* The overall model was significant,  $F(5, 394) = 14.10$ ,  $p < .001$ . The constant for the model = 3.53. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.14 illustrates the significant interaction between Uncertainty Avoidance and Information Intensity. The figure was created by entering values into the regression equation for Hypothesis 15 of +1 for High Uncertainty Avoidance, -1 for Low Uncertainty Avoidance, +1 for High Information Intensity, and -1 for Low Information Intensity. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 6 that e-commerce is higher when Information Intensity is higher for both low and high Uncertainty Avoidance; however, the effect is stronger when Uncertainty Avoidance is high, such that e-commerce is higher with higher Information Intensity and lower with lower Information Intensity than when Uncertainty Avoidance is low, where the effect is not so strong.

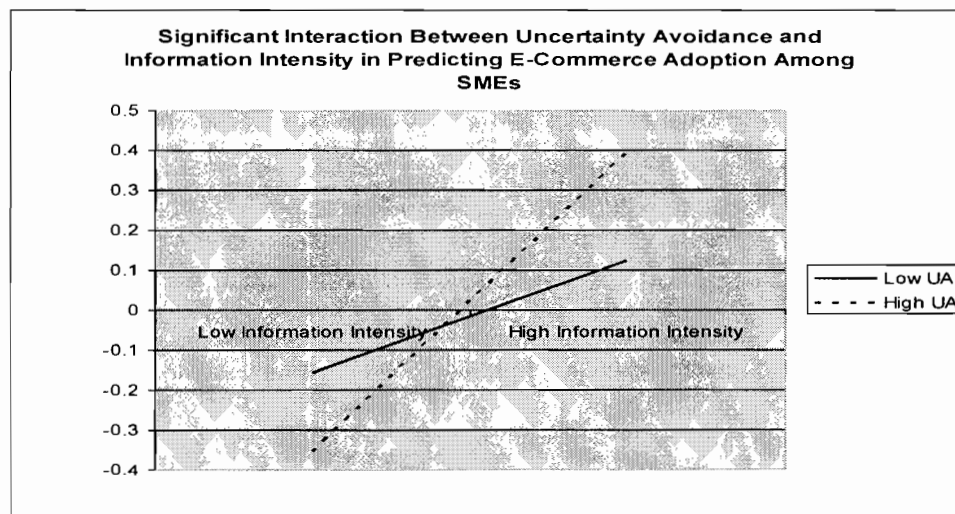


Figure 5.14  
Significant interaction Between Uncertainty Avoidance and Information Intensity in Predicting e-commerce Adoption Among SMEs

Figure 5.15 illustrates the significant interaction between Uncertainty Avoidance and Competition Intensity. The figure was created by entering values into the regression equation for Hypothesis 15 of +1 for High Uncertainty Avoidance, -1 for Low Uncertainty Avoidance, +1 for High Competition Intensity, and -1 for Low Competition Intensity. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.15 that e-commerce is higher when Competition Intensity is higher for both low and high Uncertainty Avoidance; however, the effect is stronger when Uncertainty Avoidance is low, such that e-commerce is higher with higher Competition Intensity and lower with lower Competition Intensity than when Uncertainty Avoidance is high, where the effect is not so strong.

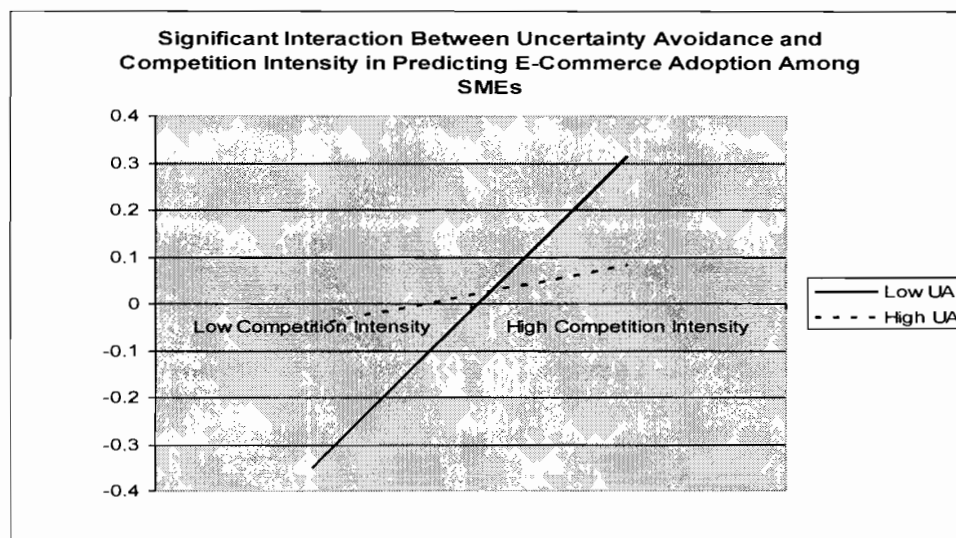


Figure 5.15  
Significant interaction Between Uncertainty Avoidance and Competition Intensity in Predicting e-commerce Adoption Among SMEs

**Hypothesis (16):** Individualism moderates the relationship of the organisational context with the e-commerce adoption among SMEs. Hypothesis 16 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Size\ of\ firm + B2*Attitude + B3*Innovativeness + B4*Knowledge + B5*Individualism + B6*Size*Individualism + B7*Attitude*Individualism + B8*Innovativeness*Individualism + B9*Knowledge*Individualism + e$ . Size of firm, Attitude, Innovativeness, and Knowledge were the four measures of organisational context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of organisational context and Individualism. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.24 presents the results of the multiple regression. The overall model was significant,  $F(9, 388) = 5.03, p < .001$ , explaining 10.5% of the variance in e-commerce. When the four independent variables from the organisational context, Individualism, and their interactions were considered simultaneously in the regression model, three of the non-interaction terms were positive significant predictors of e-commerce: Attitude ( $\beta = .19, p < .001$ ), Size of firm ( $\beta = .16, p < .01$ ), and Innovativeness ( $\beta = .16, p < .01$ ), indicating that as any of those variables increased, so did the e-commerce adoption. One of the interaction terms was significant as well: Individualism  $\times$  Innovativeness ( $\beta = -.14, p < .01$ ). This means that the relation between Innovativeness and e-commerce was different depending on the level of

Individualism a firm had. Thus, Hypothesis 16 was supported for the organisational context variable Innovativeness such that Individualism moderated the relation between Innovativeness and e-commerce, but this moderator effect did not hold for the other organisational variables.

*Table 5.24*  
*Regression Model for Predicting e-commerce from Organisation and Individualism/Collectivism and Their Interactions (Hypothesis 16)*

Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>
Size of firm	0.14	0.04	.16**	3.08	.002
Attitude	0.16	0.05	.19***	3.37	.001
Knowledge	-0.05	0.05	-.06	-1.08	.279
Innovativeness	0.14	0.05	.16**	2.81	.005
Individualism/collectivism (IC)	0.04	0.04	.05	1.02	.307
IC × Size	-0.00	0.04	-.00	-0.05	.961
IC × Attitude	-0.06	0.05	-.07	-1.15	.252
IC × Knowledge	-0.06	0.05	-.06	-1.11	.268
IC × Innovativeness	-0.14	0.05	-.14**	-2.74	.007

*Note.* The overall model was significant,  $F(9, 388) = 5.03, p < .001$ . The constant for the model = 3.56. \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.16 illustrates the significant interaction between Individualism/Collectivism and Innovativeness. The figure was created by entering values into the regression equation for Hypothesis 16 of +1 for High Individualism/Collectivism, -1 for Low Individualism/Collectivism, +1 for High Innovativeness, and -1 for Low Innovativeness. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 8 that level of Innovativeness does not matter much for e-commerce adoption when Individualism/Collectivism is high, but when Individualism/Collectivism is low, firms with higher Innovativeness scores have much higher e-commerce adoption than firms with low Innovativeness scores.

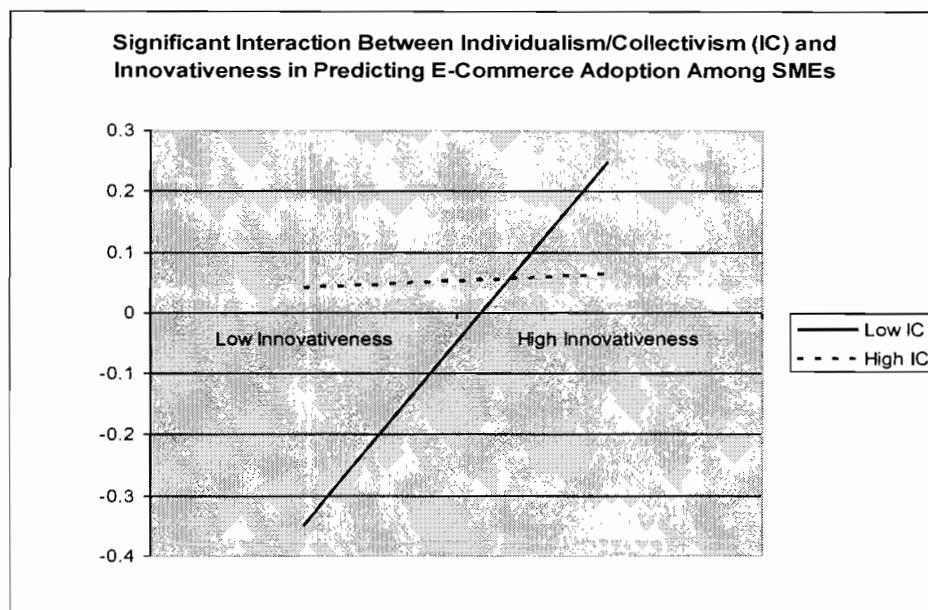


Figure 5.16  
Significant Interaction Between Individualism/Collectivism and Innovativeness in Predicting e-commerce Adoption Among SMEs

**Hypothesis (17):** Individualism moderates the relationship of the technology context with the e-commerce adoption among SMEs. Hypothesis 17 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Relative\ Advantage + B2*Compatibility + B3*Complexity + B4*Individualism + B5*Relative\ Advantage*Individualism + B6*Compatibility*Individualism + B7*Complexity*Individualism + e$ . Relative Advantage, Compatibility, and Complexity were the three measures of technology context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of technology context and Individualism. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.25 presents the results of the multiple regression. The overall model was not significant,  $F(7, 392) = 1.39, p > .05$ , explaining only 2.4% of the variance in e-commerce. When the three independent variables from the technology context, Individualism, and their interactions were considered simultaneously in the regression model, one of the non-interaction terms was a negative significant predictor of e-commerce: Relative Advantage ( $\beta = -.12, p < .05$ ), indicating that as Relative Advantage increased, the e-commerce adoption decreased. None of the interaction terms was significant. Thus, Hypothesis 17 was not supported for the technology context because Individualism did not interact with any of the technology variables in predicting the e-commerce adoption.

*Table 5.25*  
*Regression Model for Predicting e-commerce From Technology and Individualism/Collectivism and Their Interactions (Hypothesis 17)*

Predictors	<i>B</i>	<i>SE B</i>	<i>Et</i>	<i>p</i>	<i>R</i> <sup>2</sup>	
Relative advantage	-0.11	0.05	-.12*	-2.12	.035	.024
Compatibility	0.05	0.06	.06	0.90	.368	
Complexity	-0.04	0.05	-.04	-0.80	.423	
Individualism/collectivism (IC)	0.09	0.05	.10	1.80	.072	
IC × Relative Advantage	-0.04	0.05	-.05	-0.75	.452	
IC × Compatibility	0.03	0.07	.04	0.48	.634	
IC × Complexity	0.08	0.05	.09	1.70	.091	

*Note.* The overall model was not significant,  $F(7, 392) = 1.39$ ,  $p > .05$ . The constant for the model = 3.52. \* $p < .05$ .

**Hypothesis (18):** Individualism moderates the relationship of the environmental context with the e-commerce adoption among SMEs. Hypothesis 18 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Information\ Intensity + B2*Competition\ Intensity + B3*Individualism + B4*Information\ Intensity*Individualism + B5*Competition\ Intensity*Individualism + e$ . Information Intensity and Competition Intensity were the two measures of environmental context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of environmental context and Individualism. All predictor



variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.26 presents the results of the multiple regression. The overall model was significant,  $F(5, 394) = 14.80, p < .001$ , explaining 15.8% of the variance in e-commerce. When the two independent variables from the environmental context, Individualism, and their interactions were considered simultaneously in the regression model, two of the non-interaction terms were positive significant predictors of e-commerce: Competition Intensity ( $\beta = .26, p < .001$ ) and Information Intensity ( $\beta = .22, p < .001$ ), indicating that as either of those variables increased, so did the e-commerce adoption. One of the interaction terms was significant as well: Individualism  $\times$  Competition Intensity ( $\beta = .15, p < .01$ ). This means that the relation between Competition Intensity and e-commerce was different depending on the level of Individualism a firm had. Thus, Hypothesis 18 was supported for the environmental context variable Competition Intensity such that Individualism moderated the relation between Competition Intensity and e-commerce, but the moderator effect did not hold for Information Intensity.

*Table 5.26*  
*Regression Model for Predicting e-commerce From Environment and Individualism/Collectivism and Their Interactions (Hypothesis 18)*

Predictors	<i>B</i>	<i>SE B</i>	<i>β</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Information intensity	0.19	0.04	.22***	4.36	.000
Competition intensity	0.23	0.04	.26***	5.35	.000
Individualism/Collectivism (IC)	0.00	0.04	.00	0.01	.994
IC x Information Intensity	0.05	0.06	.05	0.85	.396
IC x Competition Intensity	0.12	0.04	.15**	2.77	.006

*Note.* The overall model was significant,  $F(5, 394) = 14.80, p < .001$ . The constant for the model = 3.52. \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.17 illustrates the significant interaction between Individualism/Collectivism and Competition Intensity. The figure was created by entering values into the regression equation for Hypothesis 18 of +1 for High Individualism/Collectivism, -1 for Low Individualism/Collectivism, +1 for High Competition Intensity, and -1 for Low Competition Intensity. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 9 that e-commerce is higher when Competition Intensity is higher for both low and high Individualism/Collectivism; however, the effect is stronger when Individualism/Collectivism is high, such that e-commerce is higher with higher Competition Intensity and lower with lower Competition Intensity than when Individualism/Collectivism is low, where the effect is not so strong.

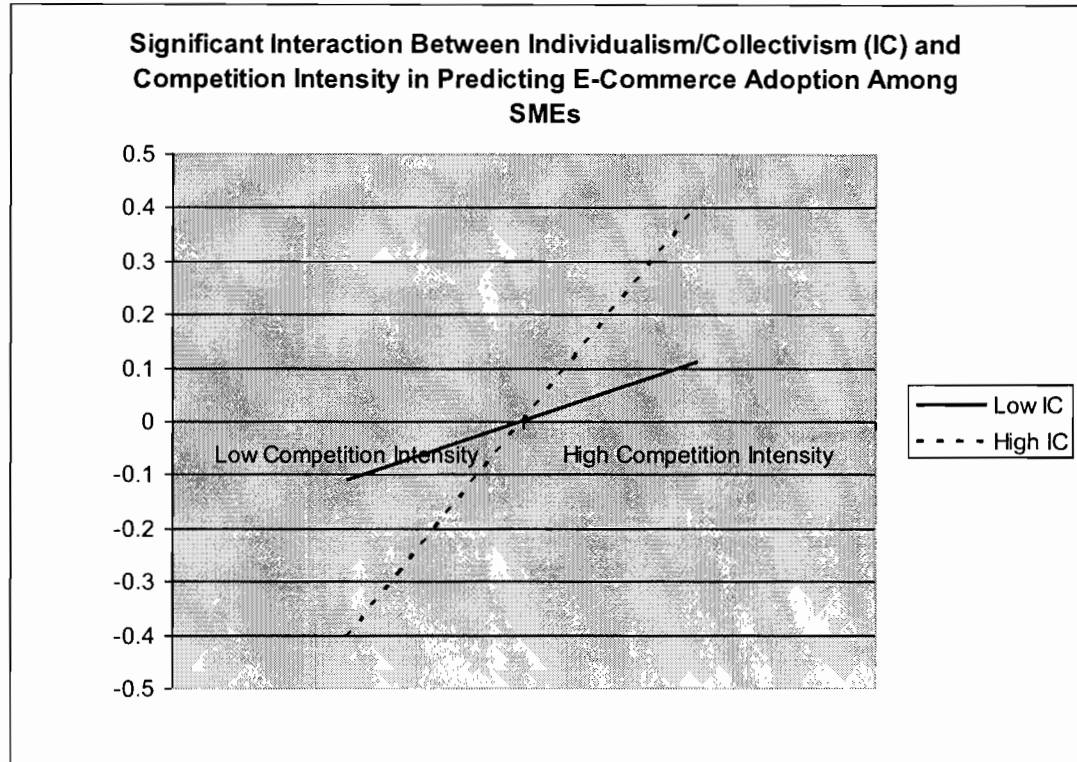


Figure 5.17  
Significant Interaction Between Individualism/Collectivism and Competition Intensity in Predicting e-commerce Adoption Among SMEs

**Hypothesis (19):** Masculinity moderates the relationship of the organisational context with the e-commerce adoption among SMEs. Hypothesis 19 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1 \cdot \text{Size of firm} + B2 \cdot \text{Attitude} + B3 \cdot \text{Innovativeness} + B4 \cdot \text{Knowledge} + B5 \cdot \text{Masculinity} + B6 \cdot \text{Size} \cdot \text{Masculinity} + B7 \cdot \text{Attitude} \cdot \text{Masculinity} + B8 \cdot \text{Innovativeness} \cdot \text{Masculinity} + B9 \cdot \text{Knowledge} \cdot \text{Masculinity} + e$ . Size of firm, Attitude, Innovativeness, and Knowledge were the four measures of organisational context; thus, they were each included in the

regression, and an interaction term was computed between each of the measures of organisational context and Masculinity.

All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.27 presents the results of the multiple regression. The overall model was significant,  $F(9, 388) = 9.58$ ,  $p < .001$ , explaining 18.2% of the variance in e-commerce. When the four independent variables from the organisational context, Masculinity, and their interactions were considered simultaneously in the regression model, two of the non-interaction terms were positive significant predictors of e-commerce: Size of firm ( $\beta = .17$ ,  $p < .001$ ) and Attitude ( $\beta = .13$ ,  $p < .05$ ), indicating that as either of those variables increased, so did the e-commerce adoption. Two of the interaction terms were significant as well: Masculinity  $\times$  Innovativeness ( $\beta = -.32$ ,  $p < .001$ ) and Masculinity  $\times$  Size ( $\beta = .14$ ,  $p < .01$ ). This means that the relation between Innovativeness and e-commerce and the relation between size and e-commerce were different depending on the level of Masculinity a firm had. Thus, Hypothesis 19 was supported for the organisational context variables Innovativeness and Size such that Masculinity was a moderator of the relation between Innovativeness and e-commerce as well as between size and e-commerce, but the moderator effect did not hold for the other organisational variables.

Table 5.27  
Regression Model for Predicting e-commerce From Organisational and Masculinity/Femininity and Their Interactions (Hypothesis 19)

Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>	
Size of firm	0.15	0.04	.17***	3.49	.001	.182
Attitude	0.11	0.05	.13*	2.40	.017	
Knowledge	-0.05	0.05	-.06	-1.13	.260	
Innovativeness	0.02	0.05	.02	0.36	.719	
Masculinity/femininity (MF)	0.02	0.04	.02	0.42	.675	
MF × Size	0.12	0.04	.14**	3.06	.002	
MF × Attitude	-0.06	0.05	-.07	-1.19	.234	
MF × Knowledge	0.00	0.05	.00	-0.01	.989	
MF × Innovativeness	-0.26	0.04	-.32***	-6.21	.000	

Note. The overall model was significant,  $F(9, 388) = 9.58, p < .001$ . The constant for the model = 3.46. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.18 illustrates the significant interaction between Masculinity/Femininity and Firm Size. The figure was created by entering values into the regression equation for Hypothesis 19 of +1 for High Masculinity/Femininity, -1 for Low Masculinity/Femininity, +1 for High Firm Size, and -1 for Low Firm Size. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.18 that Firm Size does not matter much for e-commerce adoption when

Masculinity/Femininity is low, but when Masculinity/Femininity is high, larger firms have much higher e-commerce adoption than smaller firms.

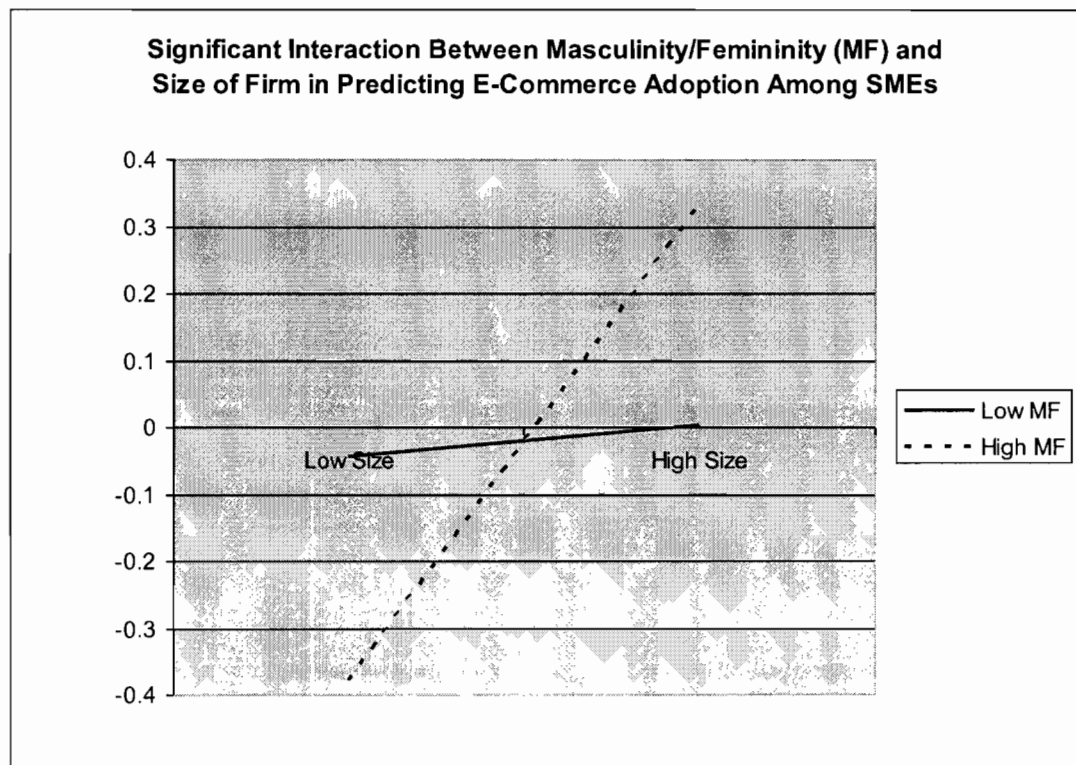


Figure 5.18  
Significant Interaction Between Masculinity/Femininity and Size of Firm in Predicting e-commerce Adoption Among SMEs

Figure 5.19 illustrates the significant interaction between Masculinity/Femininity and Innovativeness. The figure was created by entering values into the regression equation for Hypothesis 19 of +1 for High Masculinity/Femininity, -1 for Low Masculinity/Femininity, +1 for High Innovativeness, and -1 for Low Innovativeness. All

other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.19 that low and high Masculinity/Femininity interact with Innovativeness in opposite patterns such that when Masculinity/Femininity is low, firms with higher Innovativeness have a larger e-commerce adoption than firms with lower Innovativeness; but when Masculinity/Femininity is high, firms with higher Innovativeness have a much lower e-commerce adoption than firms with lower Innovativeness.

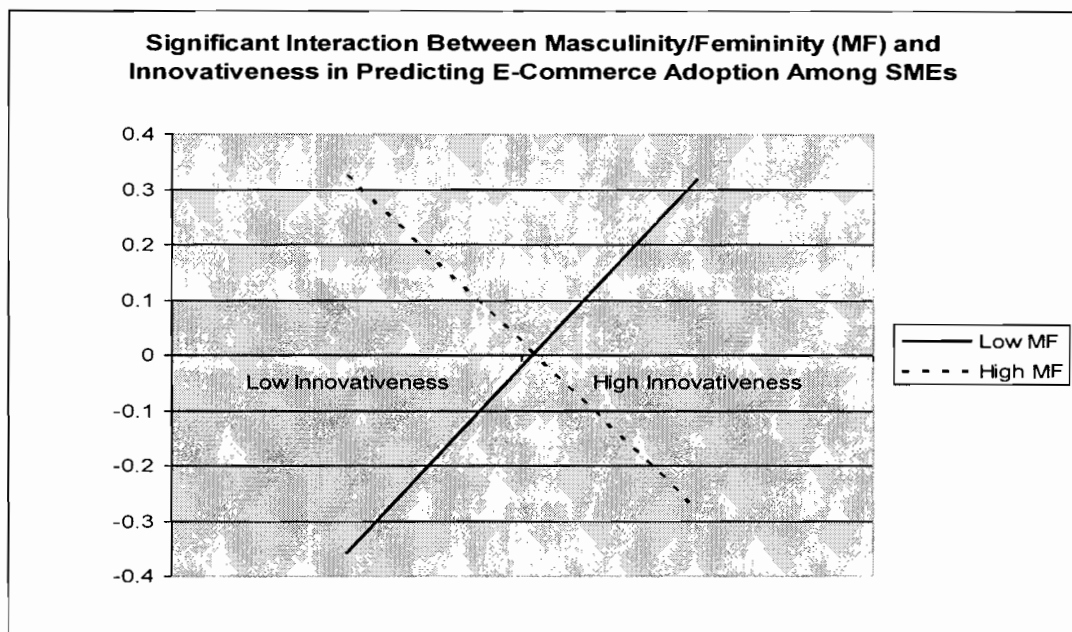


Figure 5.19  
Significant Interaction Between Masculinity/Femininity and Innovativeness in Predicting e-commerce Adoption Among SMEs

**Hypothesis (20):** Masculinity moderates the relationship of the technology context with the e-commerce adoption among SMEs. Hypothesis 20 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1*Relative\ Advantage + B2*Compatibility + B3*Complexity + B4*Masculinity + B5*Relative\ Advantage *Masculinity + B6*Compatibility*Masculinity + B7*Complexity*Masculinity + e$ . Relative Advantage, Compatibility, and Complexity were the three measures of technology context; thus, they were each included in the regression, and an interaction term was computed between each of the measures of technology context and Masculinity. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991). Table 5.28 presents the results of the multiple regression. The overall model was significant,  $F(7, 392) = 3.82, p < .001$ , explaining 6.4% of the variance in e-commerce. When the three independent variables from the technology context, Masculinity, and their interactions were considered simultaneously in the regression model, one of the non-interaction terms was a positive significant predictor of e-commerce: Masculinity ( $\beta = .14, p < .05$ ), indicating that as Masculinity increased, the e-commerce adoption also increased. One of the interaction terms was significant as well: Masculinity  $\times$  Compatibility ( $\beta = -.25, p < .001$ ). This means that the relation between Compatibility and e-commerce was different depending on the level of Masculinity a firm had. Thus, Hypothesis 20 was supported for the technology context variable Compatibility such that



Masculinity was a moderator of the relation between Compatibility and e-commerce, but this effect did not hold for the other technology variables.

*Table 5.28*  
*Regression Model for Predicting e-commerce from Technology and Masculinity/Femininity and Their Interactions (Hypothesis 20)*

Predictors	<i>B</i>	<i>SE B</i>	<i> t </i>	<i>P</i>	<i>R</i> <sup>2</sup>	
Relative advantage	-0.07	0.05	-.07	-1.34	.181	.064
Compatibility	0.02	0.05	.02	0.43	.669	
Complexity	0.01	0.05	.02	0.30	.766	
Masculinity/femininity	0.12	0.05	.14*	2.54	.012	
(MF)						
MF × Relative Advantage	-0.01	0.06	-.01	-0.20	.841	
MF × Compatibility	-0.25	0.07	-.25***	-3.66	.000	
MF × Complexity	0.01	0.05	.01	0.14	.892	

*Note.* The overall model was significant,  $F(7, 392) = 3.82, p < .001$ . The constant for the model = 3.58. \* $p < .05$ . \*\*\* $p < .001$ .

Figure 5.20 illustrates the significant interaction between Masculinity/Femininity and Compatibility. The figure was created by entering values into the regression equation for Hypothesis 20 of +1 for High Masculinity/Femininity, -1 for Low Masculinity/Femininity, +1 for High Compatibility, and -1 for Low Compatibility. All other values were entered as 0 to hold them constant at the mean value for each variable.

It can be readily seen in Figure 5.20 that low and high Masculinity/Femininity interact with Compatibility in opposite patterns such that when Masculinity/Femininity is low, firms with higher Compatibility have a larger e-commerce adoption than firms with lower Compatibility; but when Masculinity/Femininity is high, firms with higher Compatibility have a much lower e-commerce adoption than firms with lower Compatibility.

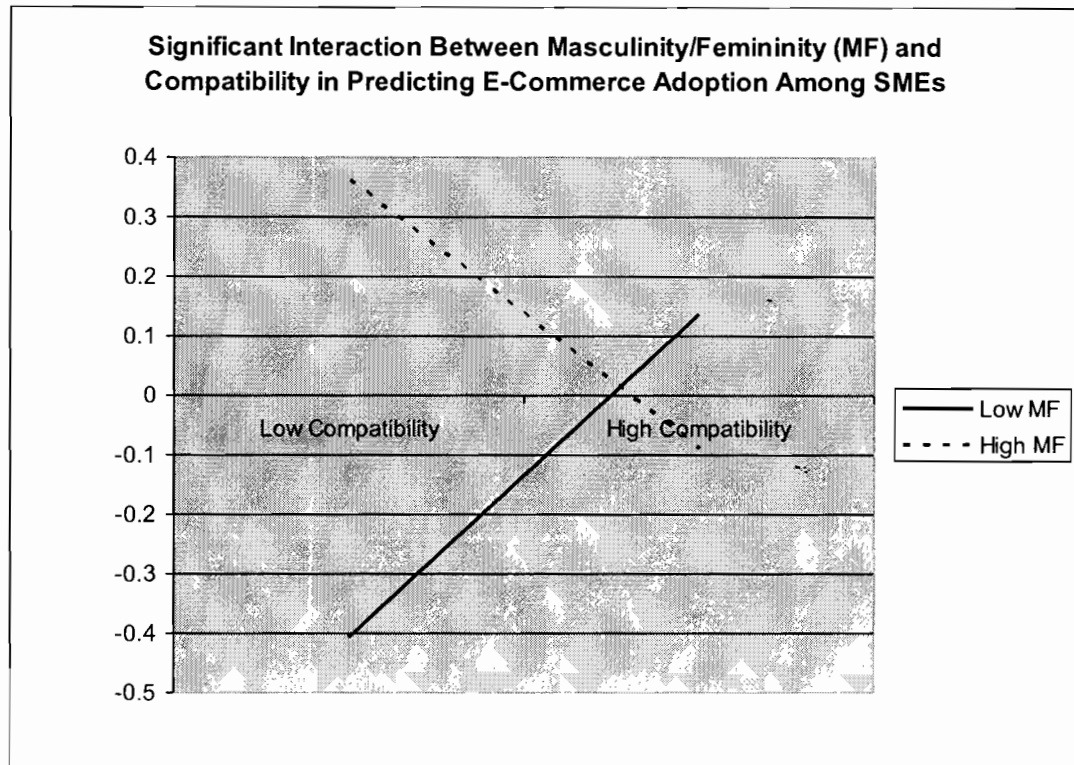


Figure 5.20  
Significant Interaction Between Masculinity/Femininity and Compatibility in Predicting e-commerce Adoption Among SMEs

**Hypothesis (21):** Masculinity moderates the relationship of the environmental context with the e-commerce adoption among SMEs. Hypothesis 21 was addressed by computing a multiple regression with the following terms:  $B2C = B0 + B1 \cdot \text{Information Intensity} + B2 \cdot \text{Competition Intensity} + B3 \cdot \text{Masculinity} + B4 \cdot \text{Information Intensity} \cdot \text{Masculinity} + B5 \cdot \text{Competition Intensity} \cdot \text{Masculinity} + e$ . Information Intensity and Competition Intensity were the two measures of environmental context; thus, they were each included in the regression, and an interaction term was computed

between each of the measures of environmental context and Masculinity. All predictor variables were mean centred by converting them to standardised scores (z-scores) before using them in the regression (Aiken & West, 1991).

Table 5.29 presents the results of the multiple regression. The overall model was significant,  $F(5, 394) = 15.48, p < .001$ , explaining 16.4% of the variance in e-commerce. When the two independent variables from the environmental context, Masculinity, and their interactions were considered simultaneously in the regression model, all three of the non-interaction terms were positive significant predictors of e-commerce: Information Intensity ( $\beta = .28, p < .001$ ), Competition Intensity ( $\beta = .24, p < .001$ ), and Masculinity ( $\beta = .11, p < .05$ ), indicating that as any of those variables increased, so did the e-commerce adoption. One of the interaction terms was significant as well: Masculinity  $\times$  Information Intensity ( $\beta = -.17, p < .01$ ). This means that the relation between Information Intensity and e-commerce was different depending on the level of Masculinity a firm had. Thus, Hypothesis 21 was supported for the environmental context variable Information Intensity such that Masculinity was a moderator of the relation between Information Intensity and e-commerce, but Masculinity did not moderate the relation between Competition Intensity and e-commerce.

Table 5.29

Regression Model for Predicting e-commerce from Environment and Masculinity/Femininity and Their Interactions (Hypothesis 21)

Predictors	B	SE B	$\beta$	P	R <sup>2</sup>
Information intensity	0.25	0.04	.28***	5.67	.000
Competition intensity	0.21	0.04	.24***	5.00	.000
Masculinity/femininity	0.10	0.04	.11*	2.38	.018
(MF)					
MF x Information Intensity	-0.13	0.04	-.17**	-3.05	.002
MF x Competition Intensity	0.00	0.05	.00	0.01	.989

Note. The overall model was significant,  $F(5, 394) = 15.48, p < .001$ . The constant for the model = 3.52. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Figure 5.21 illustrates the significant interaction between Masculinity/Femininity and Information Intensity. The figure was created by entering values into the regression equation for Hypothesis 21 of +1 for High Masculinity/Femininity, -1 for Low Masculinity/Femininity, +1 for High Information Intensity, and -1 for Low Information Intensity. All other values were entered as 0 to hold them constant at the mean value for each variable. It can be readily seen in Figure 5.21 that e-commerce is higher when Information Intensity is higher for both low and high Masculinity/Femininity; however, the effect is stronger when Masculinity/Femininity is low, such that e-commerce is

higher with higher Information Intensity and much lower with lower Information Intensity than when Masculinity/Femininity is high, where the effect is not as drastic.

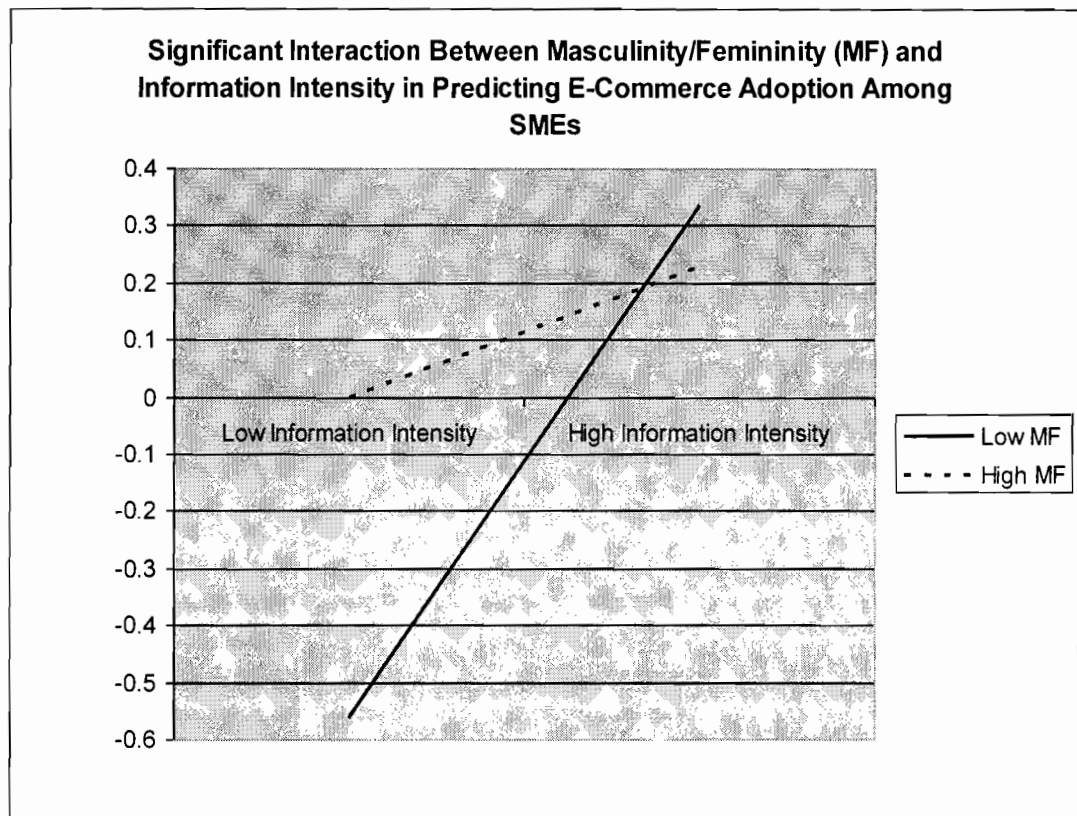


Figure 5.21  
Significant Interaction Between Masculinity/Femininity and Information Intensity in Predicting e-commerce Adoption Among SMEs

### 5.7 Socio-demographic Comparisons

In a final set of analyses, the e-commerce adoption was compared across different levels

of socio demographic variables. For variables that had only two different groups, independent *t* tests were used. The *t* test comparing males and females did not show any significant differences in the e-commerce adoption; however, the *t* test comparing companies with Web sites (*N* = 183) to companies without Web sites (*N* = 217) indicated that companies with Web sites had significantly higher e-commerce scores (*M* = 4.02, *SD* = 0.84) than companies that did not have Web sites (*M* = 3.14, *SD* = 0.70),  $t(398) = 11.44, p < .001$ . For variables that had more than two categories, one-way Analysis of Variance (ANOVA) was used to compare e-commerce scores across groups. The ANOVAs comparing e-commerce scores by location and owner's tenure did not show any significant differences. However, the ANOVAs comparing e-commerce scores across age and education showed significant differences. The overall ANOVA results for age and education are shown in Table 5.30. Post-hoc Scheffe tests were computed to determine which groups were significantly different from which other groups. For age, the post-hoc Scheffe tests indicated that the 50- to 59-year-old group had significantly higher e-commerce scores than the 30- to 39-year-old group ( $p < .01$ ), but the other age groups were not significantly different from each other on e-commerce scores. For education, the post-hoc Scheffe tests indicated that the group with master's degrees had significantly higher e-commerce scores than both the group with associate's degrees and the group with bachelor's degrees (both  $ps < .05$ ), but the other education groups were not significantly different from each other on e-commerce scores. Specific mean scores

are displayed in Table 5.30.

*Table 5.30*  
*Significant ANOVA Results for Differences in e-commerce Scores on Sociodemographic Variables*

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F(df)</i>	<i>p</i>
<b>Age</b>					
18-29	62	3.52	1.00	4.01(4, 395)**	.003
30-39	84	3.23	0.71		
40-49	153	3.60	0.90		
50-59	74	3.76	0.86		
60	27	3.64	0.85		
Total	400	3.54	0.89		
<b>Education</b>					
Below high school	32	3.60	0.77	3.18(5, 394)**	.008
High school	52	3.64	0.78		
Associate	192	3.48	0.92		
Bachelor	96	3.42	0.90		
Master	22	4.18	0.80		
Doctorate	6	3.86	0.52		
Total	400	3.54	0.89		

\*\* $p < .01$ .



## 5.8 Summary of Results

For Hypotheses 1– 9, when each of the nine independent variables was correlated separately with e-commerce, five of the independent variables showed significant positive correlations with e-commerce whereas the other four did not show significant correlations of any kind. The correlations provided support for Hypothesis 1 (Size of firm), Hypothesis 2 (Attitude), Hypothesis 3 (Innovativeness), Hypothesis 8 (Information Intensity), and Hypothesis 9 (Competition Intensity). Also for Hypotheses 1– 9, when all nine independent variables were used simultaneously in the regression equation, four of them showed significant positive relations to e-commerce and two showed significant negative relations: Higher levels of Size of firm, Attitude, Competition Intensity, and Information Intensity were related to higher e-commerce, whereas higher levels of Relative Advantage and Knowledge were related to lower e-commerce. Innovativeness, which previously showed a significant correlation, was no longer significant in the regression analysis. The results of the regression analysis provided support for Hypothesis 1 (Size of firm), Hypothesis 2 (Attitude), Hypothesis 4 (Knowledge), Hypothesis 5 (Relative Advantage), Hypothesis 8 (Information Intensity), and Hypothesis 9 (Competition Intensity). The analysis did not support Hypothesis 3 (Innovativeness), Hypothesis 6 (Compatibility), or Hypothesis 7 (Complexity).

For the moderation effects, Hypothesis 10 was supported for the Organisation context variable Size of firm such that Power Distance moderated the relation between Size and e-commerce, but did not moderate the relation between the other Organisation variables and e-commerce. More specifically, Size of firm did not matter much for e-commerce adoption when Power Distance was low, but when Power Distance was high, large firms had much higher e-commerce adoption than small firms.

Hypothesis 11 was supported for the Technology context variable Compatibility such that Power Distance moderated the relation between Compatibility and e-commerce, but did not moderate the relation between e-commerce and the other Technology variables. More specifically, compatibility did not matter much for e-commerce adoption when Power Distance was high, but when Power Distance was low, firms with higher Compatibility scores had much higher e-commerce adoption than firms with low Compatibility scores.

Hypothesis 12 was supported for the Environment context variable Information Intensity such that Power Distance moderated the relation between e-commerce and Information Intensity, but Power Distance did not moderate the relation between e-commerce and Competition Intensity. More specifically, Information Intensity did not matter much for e-commerce adoption when Power Distance was high, but when Power Distance was

low, firms with higher Information Intensity scores had much higher e-commerce adoption than firms with low Information Intensity scores.

Hypothesis 13 was supported for the Organisation context such that Uncertainty Avoidance moderated the relation between Knowledge and e-commerce and between Innovativeness and e-commerce, but this moderation effect did not hold for the other Organisation variables. More specifically, Knowledge mattered only a little bit when Uncertainty Avoidance was low, such that when Uncertainty Avoidance was low, e-commerce was only a little higher when Knowledge was higher. However, when Uncertainty Avoidance was high, firms with higher Knowledge scores had much lower e-commerce adoption than firms with low Knowledge scores. Also, when Uncertainty Avoidance was low, firms with lower Innovativeness scores had a higher extent of e-commerce adoption than firms with higher Innovativeness scores. However, the opposite finding held when Uncertainty Avoidance was high, such that firms with higher Innovativeness scores had much higher e-commerce adoption than firms with lower Innovativeness scores.

Hypothesis 14 was not supported for the Technology context because Uncertainty Avoidance did not interact with any of the Technology variables in predicting the e-commerce adoption. In other words, Uncertainty Avoidance did not moderate the relation between Technology and e-commerce.

Hypothesis 15 was supported for both Environment context variables: Information Intensity and Competition Intensity such that Uncertainty Avoidance moderated the relation between the two Environment variables and e-commerce. More specifically, e-commerce was higher when Information Intensity was higher for both low and high Uncertainty Avoidance; however, the effect was stronger when Uncertainty Avoidance was high, such that e-commerce was higher with higher Information Intensity and lower with lower Information Intensity than when Uncertainty Avoidance was low, where the effect was not so strong. Also, e-commerce was higher when Competition Intensity was higher for both low and high Uncertainty Avoidance; however, the effect was stronger when Uncertainty Avoidance was low, such that e-commerce was higher with higher Competition Intensity and lower with lower Competition Intensity than when Uncertainty Avoidance was high, where the effect was not so strong.

Hypothesis 16 was supported for the Organisation context variable Innovativeness such that Individualism moderated the relation between Innovativeness and e-commerce, but this moderator effect did not hold for the other Organisation variables. More specifically, the level of Innovativeness did not matter much for e-commerce adoption when Individualism/Collectivism was high, but when Individualism/Collectivism was low, firms with higher Innovativeness scores had much higher e-commerce adoption than firms with low Innovativeness scores.

Hypothesis 17 was not supported for the Technology context because Individualism did not interact with any of the Technology variables in predicting the e-commerce adoption. In other words, Individualism was not a moderator between Technology and e-commerce.

Hypothesis 18 was supported for the Environment context variable Competition Intensity such that Individualism moderated the relation between Competition Intensity and e-commerce, but the moderator effect did not hold for Information Intensity. More specifically, e-commerce was higher when Competition Intensity was higher for both low and high Individualism/Collectivism; however, the effect was stronger when Individualism/Collectivism was high, such that e-commerce was higher with higher Competition Intensity and lower with lower Competition Intensity than when Individualism/Collectivism was low, where the effect was not so strong.

Hypothesis 19 was supported for the Organisation context variables Innovativeness and Size such that Masculinity was a moderator of the relation between Innovativeness and e-commerce as well as between Size and e-commerce, but the moderator effect did not hold for the other Organisation variables. More specifically, Firm Size did not matter much for e-commerce adoption when Masculinity/Femininity was low, but when Masculinity/Femininity was high, larger firms had much higher e-commerce adoption than smaller firms. Also, low and high Masculinity/Femininity interacted with

Innovativeness in opposite patterns such that when Masculinity/Femininity was low, firms with higher Innovativeness had a larger e-commerce adoption than firms with lower Innovativeness; but when Masculinity/Femininity was high, firms with higher Innovativeness had a much lower e-commerce adoption than firms with lower Innovativeness.

Hypothesis 20 was supported for the Technology context variable Compatibility such that Masculinity was a moderator of the relation between Compatibility and e-commerce, but this effect did not hold for the other Technology variables. More specifically, low and high Masculinity/Femininity interacted with Compatibility in opposite patterns such that when Masculinity/Femininity was low, firms with higher Compatibility had a larger e-commerce adoption than firms with lower Compatibility; but when Masculinity/Femininity was high, firms with higher Compatibility had a much lower e-commerce adoption than firms with lower Compatibility.

Hypothesis 21 was supported for the Environment context variable Information Intensity such that Masculinity was a moderator of the relation between Information Intensity and e-commerce, but Masculinity did not moderate the relation between Competition Intensity and e-commerce. More specifically, e-commerce was higher when Information Intensity was higher for both low and high Masculinity/Femininity; however, the effect was stronger when Masculinity/Femininity was low, such that e-commerce was higher

with higher Information Intensity and much lower with lower information Intensity than when Masculinity/Femininity was high, where the effect was not as drastic.

#### ***Further Summary of Moderator Effects***

In sum, Power Distance showed significant interactions with Size of firm, Compatibility, and Information Intensity in predicting e-commerce. Uncertainty avoidance showed significant interactions with Knowledge, Innovativeness, Information Intensity, and Competition Intensity in predicting e-commerce. Individualism/Collectivism showed significant interactions with Innovativeness and Competition Intensity in predicting e-commerce. Masculinity/Femininity showed significant interactions with Size of firm, Innovativeness, Compatibility, and Information Intensity in predicting e-commerce.

## **CHAPTER SIX: DISCUSSION AND CONCLUSION**

### **6.0 Introduction**

The overall purpose of this study has been to identify certain understandings of organisational, technology, environmental, and cultural contexts is applying and expanding e-commerce adoption among SMEs in Saudi Arabia. This final chapter presents the discussions of the related findings and interprets the figures from statistical analysis into descriptive statements regarding the relationships between organisational, technology, and environmental factors and e-commerce adoption among SMEs in Saudi Arabia. In addition, discussion will include the moderating effects of culture on the influence of the determinants on e-commerce adoption among Saudi SMEs. To this end, the chapter starts with the summarisation of the study findings, followed by the study's hypotheses. Implications of the study from both theoretical and practical perspectives are also explained in detail. Finally, the limitations and recommendations for future research as well as the overall conclusions are discussed.



## **6.1 General Characteristics of the Owners**

Participants in this study were randomly sampled from the population of 78,488 SME owners concentrated in the following three main areas in Saudi Arabia: Riyadh, Eastern Saudi Arabia, and Mecca. The final sample consisted of  $N = 400$  participants who successfully completed and returned the questionnaire. It can be said that the beliefs and actions of owner in SMEs will affect the adoption of e-commerce among SMEs. The findings reveal that the majority of owners of the SMEs surveyed were male (91.25%). The majority of the ages were between 40-49 (38.25%). In addition, these owners were well educated with nearly 48 percent having at least an associate's degree, followed by a bachelor's degree with nearly 24 percent. Moreover, the majority of the owner's tenure was between 1-5 years (25.00%) followed by 6-10 years (22.75%).

## **6.2 General Characteristics of SMEs**

The proportion of SMEs from returned responses is consistent with the sampling frame retrieved from the General Organisation of Social Insurance (GOSI). There are three different locations accounting for approximately 78,488 of the SMEs in the kingdom. The successfully completed and returned questionnaires have mirrored the sampling

frame. The majority of the SMEs (44.00%) are in Riyadh. The second are in Eastern Saudi Arabia (33.00%) and the third are in Mecca (23.00%). The sizes of the SMEs surveyed were employed in small enterprises, the majority of which had between 1-25 workers (39.00%), followed by 26-50 workers (25.50%), which was still a small enterprise type. The medium enterprises were between 51-250 workers, with the remaining percentages ranging between 11.50 percent to 16.75 percent. In terms of having a firm Web site, about 45.75 percent of them already have a Web site. The findings reveal that there is room to encourage SMEs to have a Web site, however, since about more than half of the SMEs do not have yet a Web site. This figure is similar to previous observations in that some SMEs still do not have the full potential of a Web site.

### **6.3 The Findings of Determinant Factors**

The present study examines the relationship between 13 potential determinant factors and e-commerce adoption. The findings led to some factors that affect adoption decisions. From the framework of the research presented in Chapter 4, the determinant factors based on their characteristics are classified into four contexts. Thus, this section will discuss more details of each context within its factors.

### **6.3.1 Determinant factors within the organisational context**

The Organisational Context contains four determinant factors: Firm Size, Owner's Attitude, Owner's Innovativeness, and Owner's Technological Knowledge. In general, the Organisational Context has focused on four hypotheses that are discussed in the next section.

**Hypothesis (1):** There is a significant relationship between the firm size and the e-commerce adoption. The results of the regression analysis provided support for this hypothesis to adopt e-commerce among Saudi SMEs. In addition, among all independent factors, the factor of firm size was one of the most determinants of e-commerce adoption in Saudi SMEs. Moreover, it had the strongest positive significant relationship with e-commerce adoption: Firm Size ( $\beta = .16$ ,  $p < .001$ ). Thus, higher levels of Firm Size were related to higher e-commerce adoption.

Generally speaking, the size influences a firm's ability and readiness to adopt e-commerce. Moreover, it can influence the extent to which technology will be adopted by the firm. This simply means that larger firms tend to adopt technology at higher levels while the smaller firms are inclined to adopt technology at the lower levels (Cragg & Mills, 2009). The size factor has been examined in previous studies. For example,

Karakaya and Khalil (2004) in their study of 94 SMEs stated that company size had an influence on Internet adoption among SMEs. Moreover, the study of Teng (2000) revealed that a firm's size is one factor influencing the adoption of the extent of Internet commerce adoption in small businesses. This result is in line with Dandridge and Levenburg (2000), Karakaya and Khalil (2004), Al-Qirim (2005), and Chang-Shuo (2006), who also conducts a study of e-commerce/Internet adoption among SMEs.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of harmonizing the number of employees and orientation for the adoption of e-business in the firm. So it does not mean the adoption of e-commerce in the business is to reduce the number of staff.

**Hypothesis (2):** There is a significant relationship between the owner's attitudes and the e-commerce adoption. The results of the regression analysis provided support for this hypothesis to adopt e-commerce among Saudi SMEs. In addition, among all independent factors, the factor of owner's attitudes was one of the biggest determinants of e-commerce adoption in Saudi SMEs. Moreover, it had the strongest positive significant correlations with e-commerce adoption: Attitude ( $\beta = .27$ ,  $p < .001$ ). Thus, higher levels of owner's attitudes were related to higher e-commerce adoption.

According to Lubbe and Heerden (2003), the attitude influences a firm's ability and readiness to adopt e-commerce. Moreover, if the attitude of the owner is positive – that is, if he or she is well aware of the intricacies of computers and has some knowledge of technology and how to reap its benefits – then the business is likely to adopt e-commerce. The attitude factor has been examined in previous studies (e.g., Seyal & Rahman, 2003; Levy & Powell; 2003; Chang-Shuo, 2006; Nasco et al., 2008). They found the management's attitude support or owner's attitudes had a positive relationship with e-commerce adoption. The result of the current study is in line with the above studies. In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of their attitude-related e-commerce adoption. They can work together with their employees to adopt e-commerce in an efficient manner when they have a positive attitude toward e-commerce.

**Hypothesis (3):** There is a significant relationship between the owner's innovativeness and the e-commerce adoption. The results of the regression analysis did not support this hypothesis to adopt e-commerce among Saudi SMEs when considering all variables simultaneously: Innovativeness ( $\beta = .07$ ,  $p = .162$ ). In addition, it was no longer a significant predictor. Interpretation of these results could lead to two possibilities regarding the factor of owner's innovativeness in Saudi SMEs. One of them could be used alone to determine its impact on the adoption of e-commerce in Saudi SMEs. The

other can be used in the same context within other factors, taking into account the desire of owners to accept the new thing that will improve their budget against unexpected risks in the future.

This result is not in line with prior researchers (e.g., Thong, 1999; Thong & Yap, 1995; Al-Qirim, 2005) who conducted studies of e-commerce adoption among SMEs. However, the result is in line with the study by Chang-Shuo (2006) who found the innovativeness not statistically significant with the e-commerce adoption among SMEs.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of time and its impact on the adoption of new business, especially technology. In other words, if owners like to stay in the market's competition, they progress to the better stage of technology innovation.

**Hypothesis (4):** There is a significant relationship between the owner's technology knowledge and e-commerce adoption. The results of the regression analysis provided support for this hypothesis, but with a significant *negative* regression weight for owner's technology knowledge ( $\beta = -.12$ ,  $p < .05$ ). Thus, surprisingly, higher levels of knowledge were related to lower e-commerce adoption among Saudi SMEs. According to Antonelli, Ravarini, and Tagliavini (2001), lack of knowledge is the main barrier to the use of e-

commerce and ICT among SMEs. Moreover, if the knowledge of the owner is positive – that is, if he or she is well aware of the intricacies of computers and has some knowledge on technology and how to reap its benefits – then the business is likely to adopt e-commerce. The technology knowledge factor has been examined in previous studies (e.g., Thong, 1999; Thong & Yap, 1995; Jeon et al., 2006). The results of the current study are not in line with the study of Lee et al. (2006). In addition, the finding of the current study did not confirm Mallah's (2003) study that indicated the relationship between the status of e-commerce adoption among Saudi SMEs and the perception of lack of knowledge as a barrier is statistically significant. The findings of the current study, surprisingly, went against the other findings in the literature. However, there is an explanation for this finding. First, it should be noted that the correlation between knowledge and e-commerce when considering only those two variables was close to zero ( $r = .02, p > .05$ ). Thus, knowledge and e-commerce were not related in the current study when considering only those two variables alone. However, when controlling for the other predictors in the regression, the relation between knowledge and e-commerce became significant and negative ( $\beta = -.12, p < .05$ ), although it was still quite small, especially in comparison to the other significant effects. On its own, this effect appears difficult to explain at first. However, if the reader will consider the findings for Hypothesis 13, the effect becomes clearer.

### **6.3.2 Determinant factors within the technology context**

The Technology Context contains three determinant factors: Relative Advantage, Compatibility, and Complexity. In general, the Technology Context has focused on three hypotheses that are discussed in the next section.

**Hypothesis (5):** There is a significant relationship between the relative advantage and the e-commerce adoption.

The regression coefficient was negative, so this finding was unexpected and went against what was previously found in the literature. According to Tornatzky and Klein (1982) and Rogers (1983), relative advantage is conceded to be the most reliable, significant reasons for innovation adoption. In addition, studies (e.g., Lertwongsatien & Wongpinunwatana, 2003; Chang-Shuo, 2006) have stated that relative advantage is an insignificant contributor to e-commerce adoption among SMEs. However, in the current study, relative advantage was a significant negative predictor ( $\beta = -.24$ ,  $p < .001$ ) when considering all variables simultaneously. Thus, higher levels of relative advantage were related to lower e-commerce adoption among Saudi SMEs.



The four items measuring this variable listed various reasons for e-commerce to be advantageous. The reasons were: to increase sales, enlarge market share, reduce costs, enable development, and enhance relationships. Those all seem to be desirable things that one would expect would be positively related to ecommerce adoption, but the finding about perceived relative advantage was not expected. The root cause of this might be due to the fact that when the survey was taken, relative advantages were not significant enough to increase the adoption level. Another reason is also because for a specific firm, a meaningful interpretation of the perceived relative advantage of using e-commerce might not be provided using an aggregate measure. Benefits might be perceived with different end result by every firm, whereby some may consider it to be important and some may not. In such a case, a more accurate indicator of the relative advantage to the firms can be probably provided by using a composite score for relative advantage, weighted by its importance of rating.

According to Darmawan (2000), with respect to measuring performance, relative advantage has a negative effect. Overall this is interpreted as, impact of technology on people's performance is felt less when the relative advantage of the technology is perceived to be high. In addition, Leech et al., (2007), mentioned that beliefs about relative advantages with respect to online shopping may not have a direct impact on consumer adoption for online shopping and this also doesn't dilute its importance. They

stated that in future, just like how general beliefs about the internet and online shopping have changed from time to time, it is possible that beliefs about relative advantages with respect to online shopping may come into play, based on innovation diffusion theory. Even if a person is knowledgeable about e-commerce and before they would value its relative advantages, it is reasonable that owners would first need to perceive e-commerce adoption as compatible with their lifestyles and also with respect to its timing. Therefore, it leads to a possible conclusion that a temporal sequence of beliefs about an innovation's characteristics, affect adoption, based on the results observed. To put it other words, beliefs affect adoption sequentially rather than going with the assumption that beliefs about relative advantage, compatibility, and complexity affect the rate of adoption simultaneously. The result of the current study is in line with the findings from Leech et al., 2007, Darmawan, 2001, and Seyal & Rahman, 2003.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of relative advantage by the application of e-commerce in business. Comparison before and after the application may give a clear picture of the benefits and opportunities that were not taken into account.

**Hypothesis (6):** There is a significant relationship between compatibility and the e-commerce adoption. The results of the regression analysis did not support this

hypothesis to adopt e-commerce among Saudi SMEs when considering all variables simultaneously: Compatibility ( $\beta = .04$  ,  $p = .456$ ). This result is not in line with prior researchers (e.g., Teo & Ranganathan, 2004; Seyal & Rahman, 2003) who conducted studies of e-commerce adoption among SMEs. However, the result is in line with the study by Al-Qirim (2007), who found the compatibility not statistically significant with the e-commerce adoption among SMEs. In addition, the findings of the current study confirmed previous studies that indicated the compatibility is dependent on the innovation adoption among SMEs that require minimal changes within their firms, their values culture, working processes, and infrastructure; then, it is more likely for SMEs to adopt the new technology (Lertwongsatien & Wongpinunwatana, 2003; Al-Qirim, 2007).

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of alignment between the needs and wishes of customers and the innovative ability in the establishment of e-commerce application. In other words, service delivery requires coordination with all parties in the electronic process way that would help in achieving customer satisfaction.

**Hypothesis (7):** There is a significant relationship between the complexity and the e-commerce adoption. The results of the regression analysis did not support this

hypothesis to adopt e-commerce among Saudi SMEs when considering all variables simultaneously: Complexity ( $\beta = .01$ ,  $p = .894$ ). This result is in line with prior researchers (e.g., Grandon & Pearson, 2004; Chang-Shuo, 2006; Seyal & Rahman, 2003; Thong, 1999) who conducted a study of e-commerce adoption among SMEs. In addition, the result is in line with the study by Al-Qirim (2007), who found the complexity not statistically significant with the e-commerce adoption among SMEs.

Moreover, the finding of the current study confirmed studies that indicated the complexity is dependent on the innovation adoption among SMEs that requires minimal changes within the SME, its values culture, working processes, and infrastructure, then it is more likely for SMEs to adopt the new technology (Lertwongsatien & Wongpinunwatana, 2003; Al-Qirim, 2007).

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of the complexity that could arise from e-commerce application and avoided by using modern software. In addition, the attraction of skilled technical labour is a key factor to avoid risks and resulting complications.

### 6.3.3 Determinant factors within the environmental context

The Environmental Context contains two determinant factors: information intensity and competition intensity. In general, the Environmental Context has focused on two hypotheses that are discussed in the next section.

**Hypothesis (8):** There is a significant relationship between information intensity and the e-commerce adoption. The results of the regression analysis provided support for this hypothesis to adopt e-commerce among Saudi SMEs. In addition, among all independent factors, the factor of information intensity was one of the most prominent determinants of e-commerce adoption in Saudi SMEs. Moreover, it had the strongest positive significant with e-commerce adoption: Information intensity ( $\beta = .20$ ,  $p < .001$ ). Thus, higher levels of information intensity were related to higher e-commerce adoption.

According to Thong (1999), if the information intensity was high in a firm, then it is more likely for the firm to adopt e-commerce. Moreover, information intensity has been examined in previous studies (e.g., Al-Qirim, 2007; Chang-Shuo, 2006). They found that information intensity had a positive relationship with e-commerce. The result of the current study is in line with the above studies.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of information intensity in the market. This could be improved by updating the technical information and follow-up of market developments, whether domestic or foreign.

**Hypothesis (9):** There is a significant relationship between the competition intensity and the e-commerce adoption. The results of the regression analysis provided support this hypothesis to adopt e-commerce among Saudi SMEs. In addition, among all independent factors, the factor of competition intensity was one of the most prominent determinants of e-commerce adoption in Saudi SMEs. Moreover, it had the strongest positive significant with e-commerce adoption: Competition intensity ( $\beta = .23$ ,  $p < .001$ ). Thus, higher levels of competition intensity were related to higher e-commerce adoption.

According to Alzougool and Kurnia (2008), the environmental context including competition intensity is conceded to be one of the important factors that should be studied by any researcher who studies e-commerce adoption due to the critical role of it in market competition. The competition intensity has been examined in previous studies (e.g., Al-Qirim, 2007; Kuan & Chau, 2001; Scupola, 2003; Lertwongsatien & Wongpinunwatana, 2003; Grandon & Pearson, 2004). They found the competition

intensity had a positive relationship with e-commerce. The result of the current study is in line with above studies.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of competition intensity in the market. This could be improved by studying the trends and expectations of customers in the market. In addition, recognising the customer as an integral part of the business is considered an important factor. For example, attention to the opinions of customers about products and services gives the opportunity to maintain their survival in the intense competition in the market.

#### **6.3.4 Determinant factors within the cultural context**

The Cultural Context contains four dimensions: Power distance, Uncertainty avoidance, Individualism, and Masculinity. In general, the Cultural Context has focused on four hypotheses to determine the moderating effect of culture's dimensions on three contexts (organisational, technology, and environmental). These hypotheses are discussed in the next section.

#### **6.3.4.1 Power distance**

**Hypothesis(10):** Power distance moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (11):** Power distance moderates the relationship of the technology context with the e-commerce adoption among SME.

**Hypothesis (12):** Power distance moderates the relationship of the environmental context with the e-commerce adoption among SME.

Organisational context includes four variables: Firm Size, Attitude, Innovativeness, and Knowledge). Thus, they were each included in the regression to test Hypothesis 10. The results indicated that the moderating effect of Power Distance after interaction terms with the organisational context indicated that only the firm size was significant as well: Power Distance  $\times$  firm size ( $\beta = .12, p < .05$ ). This means that the relation between the firm size and e-commerce adoption was different depending on the level of Power Distance an SME had. Thus, Hypothesis 10 was partially supported for the Organisational Context such that Power Distance moderated the relation between the firm size and e-commerce adoption.



Technology context includes three variables: Relative Advantage, Compatibility, and Complexity. Thus, they were each included in the regression to test Hypothesis 11. The results indicated that one of the interaction terms was significant as well: Power Distance  $\times$  Compatibility ( $\beta = -.23$ ,  $p < .001$ ). This means that the relation between Compatibility and the e-commerce adoption was different depending on the level of Power Distance a firm had. Thus, Hypothesis 11 was partially supported for the Technology Context variable Compatibility such that Power Distance moderated the relation between Compatibility and e-commerce adoption.

Environmental Context includes two variables: Information Intensity and Competition Intensity. The results indicated that one of the interaction terms was significant as well: Power Distance  $\times$  Information Intensity ( $\beta = -.18$ ,  $p < .001$ ). This means that the relation between Information Intensity and the e-commerce adoption was different depending on the level of Power Distance a firm had. Thus, Hypothesis 12 was partially supported for the Environmental Context variable Information Intensity such that Power Distance moderated the relation between Information Intensity and e-commerce adoption.

The results of the current study is in line with previous studies (e.g., Bedford, 2005; Kollmann et al., 2009; Tawati, 2008; Phan et al., 2002; Gong, Li, & Stump, 2007; Dinev

et al., 2009) that stated the moderating variable of culture has an important effect on the adoption of technology.

In the Saudi context, Hofstede's typology mentioned that Saudi Arabia (which is an Arab country) was classified as having high power distance (Buragga, 2001). According to this classification, Yoon (2009) argued that societies from high Power Distance have less trust toward an online presence than societies from low Power Distance. In addition, Lim (2004) argued the role of the moderating effect of Power Distance in the Internet and e-commerce area. Moreover, Kollmann et al. (2009) stated that Power Distance moderated the relationship of an e-business adoption.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of a Power Distance's hierarchy through an Organisational Context in the firm to adopt e-commerce. They have to push cultural changes from high Power Distance to lower Power Distance in order to avoid barriers between employees and encourage easy communication. Owners have to continue their efforts to move from the bureaucratic structure to being more flexible, innovative, and open to more technology knowledge to improve their attitudes of e-commerce adoption.

#### **6.3.4.2 Uncertainty avoidance**

**Hypothesis (13):** Uncertainty avoidance moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (14):** Uncertainty avoidance moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (15):** Uncertainty avoidance moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

Regarding Hypothesis 13, the moderating effect of Uncertainty Avoidance after interaction terms with the organisational context indicated that two of the interaction terms were significant: Uncertainty Avoidance  $\times$  Knowledge ( $\beta = -.16, p < .01$ ) and Uncertainty Avoidance  $\times$  Innovativeness ( $\beta = .13, p < .05$ ). This means that the relation between Knowledge and e-commerce adoption and the relation between Innovativeness and e-commerce were different depending on the level of Uncertainty Avoidance a firm had. Thus, Hypothesis 13 was supported for the Organisational Context such that

Uncertainty Avoidance moderated the relation between Knowledge and e-commerce and between Innovativeness and e-commerce.

The result of the current study is in line with previous studies (e.g., Choe, 2004; Singh et al., 2005; Downing, Gallagher, & Segars, 2003; Dwyer et al., 2005) that stated that uncertainty avoidance has an important effect on the adoption of technology. In a Saudi context, Hofstede's typology mentioned that Saudi Arabia (which is an Arab country) was classified as having high Uncertainty Avoidance (Buragga, 2001). According to this classification, Junglas and Watson (2004) stated that societies with high Uncertainty Avoidance need to take additional steps to create confidence in e-commerce operations than societies from low Uncertainty Avoidance. In addition, Kollmann et al. (2009) stated that Uncertainty Avoidance moderated the relationship of organisational readiness and e-business adoption.

The significant interaction between knowledge and uncertainty avoidance in the current study is especially important to understand because it provides an explanation for the surprising negative relation between knowledge and e-commerce. Figure 5.12 is especially helpful for understanding the interaction between knowledge and uncertainty avoidance. The significant interaction between knowledge and uncertainty avoidance

indicates that for individuals who are low on uncertainty avoidance, there is the expected positive relation between knowledge and e-commerce such that more knowledge predicts greater e-commerce adoption as can be seen by the upward sloping solid line. This finding is in line with the literature. However, when uncertainty avoidance is high, knowledge becomes a negative predictor of e-commerce adoption, and this effect is very strong as can be seen by the steep negative sloping dotted line in Figure 4. Basically, uncertainty avoidance overrides the effects of knowledge on e-commerce adoption such that a person's knowledge can become a hindrance to e-commerce adoption rather than an asset when uncertainty avoidance is high. Because this negative effect is stronger than the positive effect found for low uncertainty avoidance, the overall effect for knowledge ends up being slightly negative, and the significant interaction explains the surprising finding from Hypothesis 4. In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of Uncertainty Avoidance regarding the clarity of rules and regulations in the firm. They have to push cultural changes from high Uncertainty Avoidance to lower Uncertainty Avoidance in order to avoid barriers between employees and their tasks.

Regarding Hypothesis 14, the result indicated that none of the interaction terms were significant. Thus, Hypothesis 14 was not supported for the Technology Context because Uncertainty Avoidance did not interact with any of the technology variables in

predicting the e-commerce adoption. In other words, Uncertainty Avoidance did not moderate the relation between Technology and e-commerce.

Regarding Hypothesis 15, the result indicated that both of the interaction terms were significant as well: Uncertainty Avoidance  $\times$  Information Intensity ( $\beta = .12$ ,  $p < .05$ ) and Uncertainty Avoidance  $\times$  Competition Intensity ( $\beta = -.13$ ,  $p < .01$ ). This means that the relation between Information Intensity and the e-commerce adoption and the relation between Competition Intensity and e-commerce were different depending on the level of Uncertainty Avoidance a firm had. Thus, Hypothesis 15 was supported for both Environmental Context variables. The result of the current study is in line with previous studies (e.g., Choe, 2004; Singh et al., 2005; Downing, Gallagher, & Segars, 2003; Dwyer et al., 2005) that stated the uncertainty avoidance has an important effect on the adoption of technology. In a Saudi context, Hofstede's typology mentioned that Saudi Arabia (which is an Arab country) was classified as having high Uncertainty Avoidance (Buragga, 2001). According to this classification, Junglas and Watson (2004) stated that societies with high Uncertainty Avoidance need to take additional steps to create confidence in e-commerce operations than societies from low Uncertainty Avoidance. In addition, Kollmann et al., (2009) stated that Uncertainty Avoidance moderated the relationship of organisational readiness and e-business adoption.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of Uncertainty Avoidance regarding the clarity of rules and regulations in the firm. They have to push cultural changes from high Uncertainty Avoidance to lower Uncertainty Avoidance in order to avoid barriers between employees and their tasks.

#### **6.3.4.3 Individualism/collectivism**

**Hypothesis (16):** Individualism moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (17):** Individualism moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (18):** Individualism moderates the relationship of the environmental context with the e-commerce adoption among SMES.

Regarding Hypothesis 16, one of the interaction terms was significant as well: Individualism  $\times$  Innovativeness ( $\beta = -.14$ ,  $p < .01$ ). This means that the relation between Innovativeness and e-commerce was different depending on the level of Individualism a

firm had. Thus, Hypothesis 16 was supported for the Organisational Context variable Innovativeness such that Individualism moderated the relation between Innovativeness and e-commerce.

Regarding Hypothesis 17, none of the interaction terms was significant. Thus, Hypothesis 17 was not supported for the Technology Context because Individualism did not interact with any of the technology variables in predicting the e-commerce adoption. In other words, Individualism was not a moderator between Technology and e-commerce.

Regarding Hypothesis 18, one of the interaction terms was significant as well: Individualism  $\times$  Competition Intensity ( $\beta = .15, p < .01$ ). This means that the relation between Competition Intensity and e-commerce was different depending on the level of Individualism a firm had. Thus, Hypothesis 18 was supported for the Environmental Context variable Competition Intensity such that Individualism moderated the relation between Competition Intensity and e-commerce. According to Hunter and Beck (2000), Individualism had an important effect on the adoption of technology. In addition, previous studies (e.g., Karahanna et al., 2005; Yoon, 2009; Kollmann et al., 2009; McCoy et al., 2005) have focused on individualism as a moderator variable for IT. For instance, Kollmann et al., (2009) found that Individualism had no significant moderating



effect on the relationship between organisational readiness and e-business adoption. In addition, they hypothesised that the moderating effect of individualism on the relationship between normative beliefs and intentions was also not supported (Li et al., 2009). On the contrary, the result of the current study found that Individualism moderated the relation between Innovativeness and e-commerce.

In a Saudi context, Hofstede's typology mentioned that Saudi Arabia (which is an Arab country) was classified as having low Individualism (Buragga, 2001). According to this classification, Steensma et al. (2000) stated that SMEs in Collectivistic countries are more likely to form technology alliances than SMEs in more Individualistic countries. In addition, Gefen and Heart (2006) argued that culture dimensions such as Individualism had an effect on trust beliefs in e-commerce environments. Moreover, customers who have high levels of Individualism are more likely to find technology easy to use more than in national cultures with low Individualism (Lee et al., 2007; Lim et al., 2004).

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of Individualism/Collectivism in the business environment. Work in a collective environment may be more compatible as we look at the individual as a member that complements collective action. Therefore, owners of SMEs in Saudi Arabia have to maintain the collective workplace without neglecting individual rights in order to avoid barriers of e-commerce adoption.

#### **6.3.4.4 Masculinity/femininity**

**Hypothesis (19):** Masculinity moderates the relationship of the organisational context with the e-commerce adoption among SMEs.

**Hypothesis (20):** Masculinity moderates the relationship of the technology context with the e-commerce adoption among SMEs.

**Hypothesis (21):** Masculinity moderates the relationship of the environmental context with the e-commerce adoption among SMEs.

Regarding Hypothesis 19, two of the interaction terms were significant as well: Masculinity  $\times$  Innovativeness ( $\beta = -.32, p < .001$ ) and Masculinity  $\times$  Size ( $\beta = .14, p < .01$ ). This means that the relation between Innovativeness and e-commerce and the relation between Size and e-commerce were different depending on the level of Masculinity a firm had. Thus, Hypothesis 19 was supported for the Organisational Context variables Innovativeness and Size such that Masculinity was a moderator of the relation between Innovativeness and e-commerce as well as between Size and e-commerce. Regarding Hypothesis 20, one of the interaction terms was significant as well: Masculinity  $\times$  Compatibility ( $\beta = -.25, p < .001$ ). This means that the relation between Compatibility and e-commerce was different depending on the level of

Masculinity a firm had. Thus, Hypothesis 20 was supported for the Technology Context variable Compatibility such that Masculinity was a moderator of the relation between Compatibility and e-commerce.

Regarding Hypothesis 21, one of the interaction terms was significant as well: Masculinity  $\times$  Information Intensity ( $\beta = -.17, p < .01$ ). This means that the relation between Information Intensity and e-commerce was different depending on the level of Masculinity a firm had. Thus, Hypothesis 21 was supported for the Environmental Context variable Information Intensity such that Masculinity was a moderator of the relation between Information Intensity and e-commerce.

Previous studies (e.g., Karahanna et al., 2005; Yoon, 2009; Kollmann et al., 2009; McCoy et al., 2005) have focused on Masculinity as a moderator variable for IT. For instance, Kollmann et al. (2009) found that Masculinity had a significant moderating effect on the relationship between organisational readiness and e-business adoption. In addition, the moderating effect of masculinity/femininity on the relationship between perceived ease of use and perceived usefulness with intention was hypothesised (Srite & Karahanna, 2006). Moreover, Yoon (2009) and Venkatesh et al. (2004) found that masculinity was moderated between perceived ease of use and perceived usefulness to e-commerce adoption and use.

The result of the current study is in line with the previous studies that found that masculinity had a moderating effect on e-commerce adoption.

In a Saudi context, Hofstede's typology mentioned that Saudi Arabia (which is an Arab country) was classified as having high Masculinity (Buragga, 2001). According to this classification, Kollmann et al., (2009) mentioned that high Masculinity is linked to achievements, which can lead to the adoption of e-commerce because of its impact on the situation. In addition, Steensma et al., (2000) stated that SMEs in countries with Femininity are more likely to adopt technology alliances more than SMEs in more Masculinity countries.

In this vein, the present study recommends that owners of SMEs in Saudi Arabia have to keep in mind the importance of equality mandated in e-business between men and women in the firm. This equality will create a better chance to use the spirit of challenge to face barriers in the adoption of e-commerce among SMEs.

#### **6.4 Implications For Research**

Theoretically, the researcher hopes through the current study to contribute to the field of technical knowledge and in particular the adoption of e-commerce in SMEs and the

factors that will affect the adoption. In addition, the researcher hopes to provide those interested with more practical results when adopting the strategy of e-commerce in SMEs, both in developing countries or Arab countries alike. The theoretical and practical implications of this study follow.

#### **6.4.1 Theoretical implications**

Intensity of competition is a significant impediment to the survival of firms, especially SMEs in the commercial markets (Idris, 2007). In addition, some researchers (e.g., Lertwongsatien & Wongpinunwatana, 2003; Forman, 2005) proposed that the adoption of e-commerce can put the firm within the space of competition and improve their business, as well as gain customers outside the domestic sphere. Moreover, there are previous studies that showed a keen interest in the importance of the application and use of technology as an important marketing strategy for firms and individuals. These studies have focused on some advanced models that have achieved positive results and helped to learn the extent of technology acceptance among firms or decision makers. These models include the Theory of Reason Action (TRA), the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), and the Diffusion of Innovation Theory (DoI). However, another focusing study associated with one of the previous models is still in need to provide us with a deeper understanding of this phenomenon.

Therefore, the theoretical implications of the current study are as follows.

First, this study used the Diffusion of Innovation model (Rogers, 2003) through the appropriate integration of its factors referred to previously in the first chapter with Tornatzky and Fleischer's (1990) OTE model to study the contexts affecting the adoption of e-commerce in firms.

Secondly, the study incorporated Hofstede's cultural dimensions (2001) as moderators in the model to explore the effect of culture on the influence of the OTE model on e-commerce adoption. Contexts in the proposed framework were as follows:

1. The Organisational Context contains four determinant factors: Firm Size, Owner's Attitude, Owner's Innovativeness, and Owner's Technological Knowledge.
2. The Technology Context contains three determinant factors: Relative Advantage, Compatibility, and Complexity.
3. The Environmental Context contains two determinant factors: Information Intensity and Competition Intensity.
4. The Cultural Context contains four dimensions: Power Distance, Uncertainty avoidance, Individualism, and Masculinity.

The study suggested 21 potential determinant factors that should be taken into consideration when examining the adoption of e-commerce among SMEs.

Third, the proposed research framework was empirically tested to the e-commerce adoption in the context of SMEs. The results provided evidence supporting the validity and reliability of the framework. Therefore, the implications of most determinant factors in the framework can be added for this new concept to marketing literature. In addition, the research framework can be used as a research tool in examining determinant factors in the decision to adopt other types of e-commerce as well.

#### **6.4.2 Implication for practice**

The e-commerce adoption empirically examined in the study is electronic customer relationship business (B2C) applications. A number of practical implications of the current study had significance for (a) owners/managers of SMEs facing a problem and with an intention to adopt e-commerce, or who were looking for full advantages from e-commerce adoption; (b) government agencies that are attempting to encourage the use of e-commerce applications by SMEs; (c) private agencies that are planning to extend their marketing with e-commerce strategy among SMEs; and (d) multinational organisations that have to deal with different cultures, particularly the economies of the countries that

have become interdependent with each other after the WTO agreement. The practical implications and recommendations for this study are discussed below.

First, since e-commerce adoption is dependent on the rate of the determinant variables that influence the adoption decision, there is ample room to boost it. The study identifies determinant variables that influence the adoption decision. In the case of the OTE model relationship with the e-commerce adoption, nine variables have the ability to determine the e-commerce adoption among SMEs. However, the result of the regression model indicated that six of those nine are good determinant variables and should be given the main attention. Further, the results of the regression analysis indicated which variables should be given more or less attention based on their level. For example, the results stated that the higher levels of Attitude, Competition Intensity, Information Intensity, and Firm Size were related to higher e-commerce adoption, whereas higher levels of Relative Advantage and Knowledge were related to lower e-commerce adoption. The implication is that encouraging this type of e-commerce adoption successfully requires a methodical understanding of the importance of each determinant variable – whether by owners/managers of SMEs or officials of government agencies.

Second, in the case of Cultural Effect on the influence of the OTE model relationship with the e-commerce adoption, four dimensions (Power Distance, Uncertainty



Avoidance, Individualism, and Masculinity) have the ability to determine the moderating effect of culture. There are still some differences in owners' decisions toward e-commerce adoption, since e-commerce adoption is dependent on the level of their culture. So, there is ample room to boost it.

The study used a cultural model based on Hofstede's typology (1991, 2001). However, within power distance the result of the multiple regression indicated that three determinant variables are good determinant variables and should be given the main attention. Further, the results of the regression model indicated which variables in the contexts should be given more or less attention based on their interactions. For example, the results stated that the relation between firm size in organisational context, compatibility in technology context, information intensity in environmental context and e-commerce adoption were different depending on the level of power distance an SME had. In other words, power distance was a moderator of the relation between organisational context, technology context, and environmental context, and e-commerce adoption.

In the same context regarding uncertainty avoidance, the result of the multiple regression indicated that four determinant variables were good determinant variables and should be given the main attention. Further, the results of the regression model indicated which

variables in the contexts should be given more or less attention based on their interactions. For example, the results stated that the relation between knowledge and innovativeness in organisational context, information intensity and competition intensity in environmental context and e-commerce adoption were different depending on the level of uncertainty avoidance an SME had. In other words, uncertainty avoidance was a moderator of the relation between organisational context, environmental context, and e-commerce adoption.

In the same context regarding Individualism, the result of the multiple regression indicated that two determinant variables were good determinant variables and should be given the main attention. Further, the results of the regression model indicated which variables in the contexts should be given more or less attention based on their interactions. For example, the results stated that the relation between innovativeness in organisational context, competition intensity in environmental context, and e-commerce adoption were different depending on the level of Individualism an SME had. In other words, Individualism was a moderator of the relation between organisational context, environmental context, and e-commerce adoption.

In the same context regarding Masculinity, the result of the multiple regression indicated that four determinant variables were good determinant variables and should be given the

main attention. Further, the results of the regression model indicated which variables in the contexts should be given more or less attention based on their interactions. For example, the results stated that the relation between firm size and innovativeness in organisational context, compatibility in technology context, information intensity in environmental context, and e-commerce adoption were different depending on the level of Masculinity an SME had. In other words, Masculinity was a moderator of the relation between organisational context, technology context, environmental context, and e-commerce adoption. The implication is that encouraging this type of e-commerce adoption successfully requires a methodical understanding of the importance of each cultural dimension, whether by private agencies or multinational organisations that have to deal with different cultures.

Finally, e-commerce applications face some complexity, which requires consideration of the complexity in understanding the contexts affecting them extensively. These contexts could be within the internal or external factors of the firm. Otherwise, misunderstandings will result in negative and costly consequences, especially when the firm is in the process of e-commerce adoption. Thus, the implication effects here are that the application of e-commerce strategy requires support from governments, as far as financially, and private agencies competent in this area with regard to technical support and training.

## **6.5 Limitations and Recommendations For Future Research**

There are number of limitations of the current study that need to be taken into account in the future.

### **6.5.1 Limitations**

The research proposed model in the current study includes Tornatzky and Fleischer's (1990) OTE Model, which is extended by adding the cultural values of Hofstede's (1991) model as moderating variables. The OTE model was represented in three contexts: organisational, technology, and environmental, including nine independent variables, while Hofstede's model was represented in four dimensions: power distance, uncertainty avoidance, individualism, and masculinity. Determination of the variables in the current study was one of the limitations of the study, where there could be other variables that influence the adoption of e-commerce and technological innovation. The current study was conducted on SMEs in Saudi Arabia in general, without regard to the type of sector of the SMEs. This approach was due to the transition of these projects from one sector to another as market orientation and opportunities for profit. Therefore, this limitation can be resolved by focusing in future studies on a separate sector for the SMEs, which can help to disseminate the results to the type of sector further.

Participants in the current study were owners / managers of SMEs. This trend was indicated by most previous studies, arguing that the decision makers the most impact such projects are the owners / managers of SMEs. Therefore, the researcher through the present study should have differentiated between the decision maker and the decision builder. For example, we can say that the decision maker is a person who has the power to implement the decision of what is usually the owner of the business, while the decision builder is a person who has studied or pursued the decision. Therefore, this limitation can be resolved by focusing in future studies on the participants who have an impact on the implementation of the policy maker and could help better predict the adoption of the interpretation of the new business, especially technology operations.

The present study was conducted on a representative sample of SMEs in the following areas of Riyadh, eastern Saudi Arabia, and Mecca. Despite the increase in installations in these areas of SME commercial businesses, they do not represent all the SMEs in Saudi Arabia. Sample identification in the areas mentioned in the current study is one of the limitations imposed on the study, where there are 13 areas in Saudi Arabia. Therefore, targeting the largest sample in future studies of all SMEs in Saudi Arabia could help to better explain this phenomenon and compare it to other areas.

### **6.5.2 Recommendations for future research**

The current study indicated some recommendations for future research in the area of e-commerce and SMEs that would extend the body of this study. The recommendations are as follows.

The current study could be replicated on other Arab or developing countries and the results compared. This recommendation can help the researcher in the future to increase the investigation and access to more results in predicting the adoption of e-commerce and the variables affecting them, especially in the presence of various other cultures.

In the current study, the results of the relationship between the OTE model and the e-commerce adoption indicated that there was no relationship between Innovativeness, Compatibility, Complexity and the e-commerce adoption. Therefore, the recommendation for future studies is to examine these variables to help achieve more for their impact on the e-commerce adoption, as well as to examine if their findings are in line with the current study or not. Previous studies indicated the importance of the organisational structure of firms in various business environments in general. Therefore, Tornatzky and Fleischer's (1990) OTE Model formulated the task of organisational, technology and environmental contexts in general to give researchers the opportunity to

enter the appropriate variables that may have an influence on a firm's performance in each context. In addition, other studies pointed to a difference in the nature of the firms due to cultural differences between people. Therefore, the recommendation for future studies is to study the possibility of other variables to help investigate and predict the e-commerce adoption among SMEs. Such variables could include financial resources, managerial time, and employee readiness regarding the organisational context, government support, government pressure, consumer readiness, security, managerial productivity regarding the technology context and product radicality, and technological infrastructure regarding the environmental context. The current study adopted Hofstede's (1991) model with four dimensions as moderated. Therefore, the recommendation for future studies is to examine other moderator variables (e.g., governmental regulation, governmental financial support and the spread of technical education centres). This may help to achieve more for their impact and predict the adoption of e-commerce among SMEs.

The current study adopted Tornatzky and Fleischer's (1990) OTE Model and Hofstede's (1991, 2001) model to predict the e-commerce adoption among SMEs. Therefore, the recommendation for future studies is to apply these models to the work of other marketing strategies among SMEs. The current study adopted a quantitative method. Therefore, the recommendation for future studies is to add another method as a

qualitative method. This could especially work when conducting the study on a particular sector of SMEs, because the interview with respondents can assist in obtaining significant results, particularly in the cultural context. The current study used one kind of e-commerce implication, which was B2C. Therefore, the recommendation for future studies is to investigate the possibility of other e-commerce implications, such as B2B and B2G, in SMEs.

## **6.6 Concluding Remarks**

The current study has tested 21 hypotheses concerning the relationship between IDVs, which included organisational, technology, and environmental contexts, and DVs, which included the e-commerce adoption and the moderating effect of culture on the influence of these relationships in the specific context of SMEs in Saudi Arabia. The researcher hopes that the results of the current study will provide an increasing knowledge and understanding of e-commerce adoption among SMEs, which has received little attention in the literature. The researcher has used multiple regressions to test the first nine hypotheses (H1 – H9) related to the relationship between organisational, technology, and environmental contexts and the e-commerce adoption. The regression model and all other subsequent regression models were first assessed to determine whether they met



the necessary assumptions of multiple regression. First, the variables were assessed to be sufficiently normally distributed. Second, a linear relationship was determined between the independent and dependent variables by plotting the studentised residuals against the standardised predicted values of the dependent variable for each regression. Third, the variables were previously determined to be measured reliably. Fourth, homoscedasticity was done, which is a measure of whether the error variances are equal across all levels of the independent variables. Finally, the independent variables were assessed for multicollinearity.

The results of the regression analysis provided support for Hypothesis 1 (Size of firm), Hypothesis 2 (Attitude), Hypothesis 4 (Knowledge), Hypothesis 5 (Relative Advantage), Hypothesis 8 (Information Intensity), and Hypothesis 9 (Competition Intensity). The analysis did not support Hypothesis 3 (Innovativeness), Hypothesis 6 (Compatibility), and Hypothesis 7 (Complexity).

Multiple regression was used to test the remaining hypotheses (H10 – H21) related to the moderating effect of culture on the influence of the organisational, technology, and environmental contexts and the e-commerce adoption. In addition, all nine measures of the organisational, technology, and environmental contexts were each included in the regression, and an interaction term was computed between each of the measures of the

organisational, technology, and environmental contexts and each dimension of culture. The results of the multiple regression analysis provided support for Hypothesis 10 (Organisational Context and Power Distance), Hypothesis 11 (Technology Context and Power Distance), Hypothesis 12 (Environmental Context and Power Distance), Hypothesis 13 (Organisational Context and Uncertainty avoidance), Hypothesis 15 (Environmental Context and Uncertainty Avoidance), Hypothesis 16 (Organisational Context and Individualism), Hypothesis 18 (Environmental Context and Individualism), Hypothesis 19 (Organisational Context and Masculinity) , Hypothesis 20 (Technology Context and Masculinity), and Hypothesis 21 (Environmental Context and Masculinity). The analysis did not support Hypothesis 14 (Technology Context and Uncertainty Avoidance) and Hypothesis 17 (Technology Context and Individualism).

In general, the results supported the hypotheses that the determinant variables identified in the current study can influence the e-commerce adoption and that culture can moderate the relationship influence of the organisational, technology and environmental contexts on the e-commerce adoption. Even though the evidence has generally supported the hypotheses, more research needs to be carried out to study other variables that can possibly affect the e-commerce adoption so that our understanding and facts about the issues of SMEs and e-commerce adoption can be further enhanced.

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## **SURVEY OF SMEs IN SAUDI ARABIA**

Dear Sir

I am currently a PhD student attached to the College of Business, Universiti Utara Malaysia. I am conducting a research on the influence of organisation, technology and environment on e-commerce adoption among SMEs in Saudi Arabia. The results of this research may benefit organizations such as yours by identifying variables that can increase firm performance.

I wish to request between 15 to 20 minutes of your time to complete the enclosed questionnaire. Each question is critical to the success of this research. Each section also includes instructions to ensure accurate responses. All responses will be kept confidential.

I thank you in advance for your cooperation and contribution to this study.

Abdul Rahman Almoawi

PhD candidate

## Appendix A

### English Questionnaire

#### Part 1: Organisation Context

<i>Organisation Profile</i>	
<b>1-# of Employees</b>	<input type="checkbox"/> 1 -25 <input type="checkbox"/> 26-50 <input type="checkbox"/> 51-100 <input type="checkbox"/> 101- 150 <input type="checkbox"/> 151-250
<b>2-organisation Location</b>	<input type="checkbox"/> Riyadh <input type="checkbox"/> Eastern <input type="checkbox"/> Mecca
<b>3-Does the company have a web site?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Owner's Profile</i>	
<b>4-Gender</b>	<input type="checkbox"/> Male <input type="checkbox"/> Female
<b>5-Age</b>	<input type="checkbox"/> 18-29 <input type="checkbox"/> 30-39 <input type="checkbox"/> 40-49 <input type="checkbox"/> 50 - 59 <input type="checkbox"/> 60 +
<b>6-Education</b>	<input type="checkbox"/> Below High School <input type="checkbox"/> High School <input type="checkbox"/> Associate <input type="checkbox"/> Bachelor <input type="checkbox"/> Master <input type="checkbox"/> Doctorate
<b>7-Owner's Tenure (Year)</b>	<input type="checkbox"/> 1-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 11 - 15 <input type="checkbox"/> 16-20 <input type="checkbox"/> 21+

*The following section relates to your technological knowledge. Please indicate which of the following computer skills you possess.*

*(You may select more than one).*

**8- Owner's Technological Knowledge**

- ☐-I can use a word-processing program (e.g., MS-Word) to organise documents.
- ☐-I can use a presentation graphics program (e.g., MS-PowerPoint) to present data.
- ☐-I can use a database program (e.g., MS-Access) to manage data.
- ☐-I can use a spreadsheet program (e.g., MS-Excel) to analyse data.
- ☐-I know how to use Web browser programs (e.g., Netscape, Internet Explorer).
- ☐-I can compose, send, and read email messages.
- ☐-I use the Internet to gather information for my professional or personal life.
- ☐-I am familiar with the basic operations of a computer (e.g., move/copy files, save files, print documents, use a CD-ROM, etc.).
- ☐-I have attended computer classes.

*The following section relates to your attitude toward the adoption of e-commerce. For each statement, please circle the appropriate number that best describes your personal beliefs.*

<b>Owner's Attitude toward e-commerce adoption</b>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I believe that soon most businesses will be conducted using e-commerce.	1	2	3	4	5
2	I believe that the use of e-commerce can enhance the standard of living.	1	2	3	4	5
3	I believe that life will be easier and faster with the use of e-commerce.	1	2	3	4	5
4	I believe that e-commerce is an efficient way to get information.	1	2	3	4	5
<b>Owner's Innovativeness</b> Please answer in this section. There are no rights or wrong answers; simply record your first impression.						
5	I seek new ways to do things.	1	2	3	4	5
6	I am generally cautious about accepting new ideas.	1	2	3	4	5
7	I frequently improvise methods for solving problems when the answer is not apparent.	1	2	3	4	5
8	I am suspicious of new inventions and new ways of thinking.	1	2	3	4	5
9	I rarely trust new ideas until I know if the majority of people around me accept them.	1	2	3	4	5
10	I consider myself to be creative and original in my thinking and behavior.	1	2	3	4	5

<i>Owner's Innovativeness</i>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11	I am usually one of the last People in my group to accept something new.	1	2	3	4	5
12	I am reluctant to adopt new ways of doing things until I see them working for people.	1	2	3	4	5
13	I tend to feel that the old way of living and doing things is the best way.	1	2	3	4	5
14	I am challenged by ambiguities and unsolved problems.	1	2	3	4	5
15	I am receptive to new ideas.	1	2	3	4	5

## **Part 2: Technology Context**

*This section relates to your perception of technology characteristics. For each statement, please circle the appropriate number that best describes how you feel about e-commerce as a technology.*

<i>Relative Advantage</i>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
16	I perceive e-commerce to be advantageous, because it increases sales and enlarges market share for our firm.	1	2	3	4	5
17	I perceive e-commerce to be advantageous when it reduces costs for our firm.	1	2	3	4	5
18	I perceive e-commerce to be advantageous when it enables the development of new businesses for our firm.	1	2	3	4	5
19	I perceive e-commerce to be advantageous, because it enhances our relationships with suppliers.	1	2	3	4	5

<i>Compatibility</i>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20	I perceive e-commerce to be highly compatible with our earlier experience of technological innovation adoption.	1	2	3	4	5
21	I perceive e-commerce to be highly compatible with the values, beliefs, and business needs of our firm.	1	2	3	4	5
22	I perceive e-commerce to be highly compatible with the e-commerce activities adopted by our suppliers and partners.	1	2	3	4	5
<i>Complexity</i>						
23	I perceive e-commerce to be complex when our firm faces a lack of appropriate tools.	1	2	3	4	5
24	I perceive e-commerce to be complex when our firm faces a lack of funding.	1	2	3	4	5
25	I perceive e-commerce to be complex when our firm faces a lack of expertise.	1	2	3	4	5
26	I perceive e-commerce to be complex when our firm faces a lack of industry standard.	1	2	3	4	5

### **Part 3: Environmental Context**

*This section relates to the situation of your organisation within the industry. For each statement, please circle the appropriate number that best describes how you feel about the situation of your organisation within the industry in which your organisation operates.*

<b>Information Intensity</b>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
27	My firm is dependant on up-to-date information.	1	2	3	4	5
28	My firm must have access to reliable, relevant, and accurate information.	1	2	3	4	5
29	My firm must be able to access information quickly whenever it is needed.	1	2	3	4	5
<b>Competition Intensity</b>						
30	Customers can easily switch to a competitor in this industry.	1	2	3	4	5
31	The rivalry among organisations in this industry is intense.	1	2	3	4	5
32	Substitutable products and services affect our firm in this industry.	1	2	3	4	5

#### **Part 4: The e-commerce adoption**

*This section is about the extent to which your organisation uses e-commerce. For each statement, please circle the appropriate number that come closest to the degree your firm uses e-commerce on this task.*

<b>E-commerce (B2C)</b>		<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
33	Provide customers with general information about our firm (e.g., via web sites, email, information boards).	1	2	3	4	5
34	Allow customers to locate and send information to appropriate contacts within the firm (e.g., via accessible online directories).	1	2	3	4	5
35	Send customers regular updates about new products and other developments within our firm (e.g., via email, what's new page).	1	2	3	4	5
36	Provide solutions to customer problems via Web-based service solutions and allow them to track and inquire about their orders electronically (e.g., via accessible Web page about the status of stock and delivery).	1	2	3	4	5
37	Provide after-sales service to our customers (e.g., via online information about installation and troubleshooting).	1	2	3	4	5
38	Provide information in response to consumer questions or requests (e.g., via Q&A page, intelligent agents).	1	2	3	4	5
39	Accept orders and payments electronically from customers.	1	2	3	4	5



### **Part 5: Culture Context**

*Please circle the appropriate number to which you agree or disagree with the following statement about general characteristics.*

<b><i>Individualism</i></b>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
40	Group welfare is more important than individual rewards.	1	2	3	4	5
41	Group success is more important than individual success.	1	2	3	4	5
42	Being accepted by the members of your work group is very important.	1	2	3	4	5
43	Employees should only pursue their goals after considering the welfare of the group.	1	2	3	4	5
44	Managers/Owner's should encourage group loyalty even if individual goals suffer.	1	2	3	4	5
45	Individuals may be expected to give up their goals in order to benefit group success.	1	2	3	4	5
<b><i>Uncertainty Avoidance</i></b>						
46	It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do.	1	2	3	4	5
47	Managers/Owner's expect employees to closely follow instructions and procedures.	1	2	3	4	5
48	Rules and regulations are important because they inform employees what the organisation expects of them.	1	2	3	4	5
49	Standard operating procedures are helpful to employees on the job.	1	2	3	4	5
50	Instructions for operations are important for employees on the job.	1	2	3	4	5

51	Meetings are usually run more effectively when they are chaired by a man.	1	2	3	4	5
<b>Masculinity</b>		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
52	It is more important for men to have a professional career than it is for women to have a professional career.	1	2	3	4	5
53	Men usually solve problems with logical analysis; women usually solve problems with intuition.	1	2	3	4	5
54	Solving organisational problems usually requires an active forcible approach which is typical of men.	1	2	3	4	5
55	It is preferable to have a man in a high level position rather than a woman.	1	2	3	4	5
<b>Power Distance</b>						
56	Managers/Owner's should make most decisions without consulting subordinates.	1	2	3	4	5
57	It is frequently necessary for a manager to use authority and power when dealing with subordinates.	1	2	3	4	5
58	Managers/Owner's should seldom ask for the opinions of employees.	1	2	3	4	5
59	Managers/Owner's should avoid off-the-job social contacts with employees.	1	2	3	4	5
60	Employees should not disagree with management decisions.	1	2	3	4	5
61	Managers/Owner's should not delegate important tasks to employees.	1	2	3	4	5

**Thank you**

## Appendix B

### Arabic Questionnaire

#### معلومات عن المنشأة

الرجاء رسم دائرة حول الإجابة المناسبة

#### عدد الموظفين

1- من 25\_1      2- من 26\_50      3- من 51\_100      4- من 101\_150

5- من 151\_250

#### مكان المنشأة

1- الرياض      2- المنطقة الشرقية      3- منطقة مكة المكرمة

هل تملك المنشأة موقعا إلكترونيا على شبكة الانترنت ؟

1- نعم (فضلا اكتب الموقع)      2- لا

#### معلومات عن مالك المنشأة

الجنس      1- ذكر      2- أنثى

العمر      1- من 18\_29      2- من 30\_39      3- من 40\_49      4- من 50\_59      5- أكبر من 60

#### المستوى التعليمي

1 - أدنى من الثانوية العامة      2- ثانوية عامة      3- دبلوم      4- بكالوريوس      5- ماجستير      6- دكتوراة

#### سنوات الخدمة (الخبرة)

1 - من 1\_5      2- من 6\_10      3- من 11\_15      4- من 16\_20

5- أكثر من 21 سنة

يتعلق القسم التالي بمعرفتك التقنية الرجاء رسم دائرة حول أي من هذه المهارات في الحاسب الآلي ترى أنك تجيدها. (بإمكانك اختيار أكثر من واحدة).

- ١ -استطيع استخدام برنامج معالجة النصوص (مثل مايكروسوفت وورد) لتنظيم الوثائق والكتابة.
- ٢ -استطيع استخدام برنامج العرض (مثل البور بوينت) لتقديم المعلومات.
- ٣ -استطيع استخدام برنامج قاعدة البيانات (مثل مايكروسوفت أكسس) للحصول على التقارير .
- ٤ -استطيع استخدام برنامج الجداول (مثل مايكروسوفت إكسيل) لإدخال وتحليل البيانات.
- ٥ -استطيع استخدام برامج متصفح النت (مثل إنترنت إكسبلورر).
- ٦ -استطيع القيام بإعداد وإرسال وقراءة رسائل البريد الإلكتروني.
- ٧ -استطيع استخدام الإنترنت لجمع معلومات لحياتي العملية أو الشخصية.
- ٨ -لدي المعرفة بالعمليات الأساسية للحاسب الآلي ( مثل نسخ وتعديل وحفظ الملفات وطباعة المستندات واستخدام الاسطوانات المدمجة الخ. ) .
- ٩ - حصلت مسبقا على دورة تدريبية في الحاسب الآلي.

يتعلق القسم التالي بموقفك نحو تبني التجارة الإلكترونية. لكل عبارة الرجاء اختيار المستوى الأفضل الذي يصف اعتقادك الشخصي. برسم دائرة حول الخانة المعبرة عن رأيك .

العبارة	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
أعتقد بأن غالبية الأعمال التجارية قريباً ستستخدم التجارة الإلكترونية.	5	4	3	2	1
أعتقد بأن استخدام التجارة الإلكترونية يمكن ان يحسن من مستوى المعيشة.	5	4	3	2	1
أعتقد بأن الحياة ستكون أسهل وأسرع باستخدام التجارة الإلكترونية.	5	4	3	2	1
أعتقد بأن التجارة الإلكترونية الطريق الأمثل للحصول على المعلومات.	5	4	3	2	1

يتعلق القسم التالي بإبداعك. لكل عبارة الرجاء اختيار المستوى الأفضل الذي يصف انطباعتك. رجاء أجب بسرعة في هذا القسم. ليس هناك أجوبة صحيحة أو خاطئة؛ فقط لتسجيل انطباعتك الأولى ببساطة.

العبارة	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
ابحث عن الطرق الجديدة لعمل الأشياء.	5	4	3	2	1
بشكل عام أكون حذرا لقبول الأفكار الجديدة.	5	4	3	2	1
كثيرا ما ارتجل الطرق لحل المشاكل عندما لا يكون الجواب ظاهرا.	5	4	3	2	1
أكون مرتابا من الاختراعات الجديدة والطرق الجديدة في التفكير.	5	4	3	2	1
نادرا ما اعتقد بالأفكار الجديدة حتى اعرف أن أغلبية الناس من حولي متقبلين لها.	5	4	3	2	1
اعتبر نفسي مبدعا وواضحا في تفكيري وسلوكي.	5	4	3	2	1
عادة أكون متأخرا للاقتناع وقبول الشيء الجديد.	5	4	3	2	1
امتنع عن تبني الطرق الجديدة لعمل الأشياء حتى أراها تعمل للناس.	5	4	3	2	1
اشعر بأن الطريق القديم للمعيشة وعمل الأشياء أفضل طريق.	5	4	3	2	1
أتحدى الحالات الغامضات والمشاكل الغير محلولة.	5	4	3	2	1
لدي القبول إلى الأفكار الجديدة.	5	4	3	2	1

القسم التالي يتعلق برؤيتك لخصائص التقنية لكل عبارة الرجاء اختيار المستوى الأفضل الذي يصف رؤيتك تجاه التجارة الالكترونية كتقنية.

العبارة	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
أرى بان التجارة الالكترونية مفيدة، لزيادة ربحية منشأتنا وكبر حصتها في السوق.	5	4	3	2	1
أرى بان التجارة الالكترونية مفيدة، لخفض التكاليف في منشأتنا.	5	4	3	2	1
أرى بان التجارة الالكترونية مفيدة، لتطوير الأعمال التجارية الجديدة لمنشأتنا.	5	4	3	2	1
أرى بان التجارة الالكترونية مفيدة، لتحسين علاقتنا مع الموردين أو الموزعين.	5	4	3	2	1
أرى بان التجارة الالكترونية متوافقة وبشكل كبير مع خبرتنا الحديثة في تبني التقنية.	5	4	3	2	1
أرى بان التجارة الالكترونية متوافقة وبشكل كبير مع أهداف ومتطلبات العمل لمنشأتنا.	5	4	3	2	1
أرى بان التجارة الالكترونية متوافقة وبشكل كبير مع نشاط الموردين أو الموزعين لمنشأتنا.	5	4	3	2	1
أرى تعقيد في التجارة الالكترونية عندما تواجه منشأتنا نقص في الأدوات اللازمة للتقنية.	5	4	3	2	1
أرى تعقيد في التجارة الالكترونية عندما تواجه منشأتنا قلة في التمويل.	5	4	3	2	1
أرى تعقيد في التجارة الالكترونية عندما تواجه منشأتنا قلة في الخبرة الآلية.	5	4	3	2	1
أرى تعقيد في التجارة الالكترونية عندما تواجه منشأتنا قلة في توفر المواصفات والمقاييس الصناعية المطلوبة.	5	4	3	2	1

هذا القسم يتعلق بحالة منشأتك ضمن القطاع الذي تعمل به. لكل عبارة الرجاء اختيار المستوى الأفضل الذي يصف شعورك تجاه حالة منشأتك ضمن القطاع التي تعمل به.

العبارة	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
منشأتني معتمدة على أحدث المعلومات في قطاعها.	5	4	3	2	1
منشأتني يجب أن يكون عندها قدرة للوصول إلى المعلومات الدقيقة والصحيحة الخاصة بقطاعها.	5	4	3	2	1
منشأتني يجب أن يكون عندها القدرة في الحصول على المعلومات بطريقة سريعة عند الحاجة.	5	4	3	2	1
انتقال العملاء إلى منافس آخر في القطاع الذي نعمل به يكون سهلا.	5	4	3	2	1
المنافسة حادة بين المنشآت في القطاع الذي تنتمي إليه منشأتني.	5	4	3	2	1
تؤثر السلع والخدمات البديلة على منشأتنا في هذا القطاع .	5	4	3	2	1

القسم التالي يتعلق بالسياق الذي تستعمله منشأتك في التجارة الالكترونية لكل عبارة الرجاء اختيار المستوى الأفضل الذي يكون أقرب إلى منشأتك في استعمالها.

تعريف العملاء آليا بالمعلومات العامة الخاصة بمنشأتنا عن طريق مواقع الانترنت والبريد الالكتروني.	5	4	3	2	1
السماح للعملاء آليا باختيار مكان وإرسال المعلومات لهم من موقع المنشأة على الإنترنت بطريقة سهلة .	5	4	3	2	1
تعريف العملاء آليا بالأنظمة الحديثة والمنتجات والخدمات الجديدة والتطورات الأخرى في منشأتنا عن طريق البريد الإلكتروني والصحف الالكترونية.	5	4	3	2	1
تزويد العملاء آليا بالحلول المناسبة عند وجود مشاكل بالمنتجات أو الخدمات المقدمة والسماح لهم بمتابعة طلباتهم عن طريق موقع المنشأة على الانترنت.	5	4	3	2	1

المعيار	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
تعريف العملاء آليا بمعلومات عن ال خدمة ما بعد البيع مثل التركيب وحل المشاكل وطلب الصيانة عن طريق موقع المنشأة على الإنترنت.	5	4	3	2	1
تزويد العملاء آليا بالردود والإجابة على الأسئلة أو الطلبات بواسطة صفحة خاصة بالأسئلة والأجوبة عن طريق موقع المنشأة على الإنترنت.	5	4	3	2	1
قبول الطلبات ودفع القيمة من العملاء آليا عبر الإنترنت.	5	4	3	2	1

هذا القسم يتعلق باعتقادك الشخصي . لكل عبارة الرجاء اختيار المستوى الأفضل الذي يصف اعتقادك.

المعيار	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
رفاهية الجميع أكثر أهمية من الرفاهية الفردية في العمل.	5	4	3	2	1
نجاح الجميع أكثر أهمية من النجاح الفردي في العمل.	5	4	3	2	1
توافق الرأي من قبل الجميع مهم جدا في العمل .	5	4	3	2	1
من الواجب على الموظف تحقيق أهدافه بعد النظر بأهداف الجميع .	5	4	3	2	1
من الواجب تشجيع الأهداف الجماعية حتى لو تأثرت الأهداف الفردية.	5	4	3	2	1
من المتوقع أن يتخلى الموظف عن أهدافه الفردية لإنجاح أهداف الجميع .	5	4	3	2	1
الحصول على متطلبات وأوامر العمل واضحة بالتفصيل تساعد الموظف في أداء واجبه تجاه عمله .	5	4	3	2	1
من المتوقع أن يقوم الموظف بتنفيذ التعليمات والإجراءات مباشرة.	5	4	3	2	1
اللوائح والتعليمات مهمة لأنها توضح للموظف نظام المنشأة .	5	4	3	2	1
إجراءات العمل وطرق تنفيذه تساعد الموظف في عمله .	5	4	3	2	1



العبارة	موافق تماما	موافق	محايد	غير موافق	غير موافق مطلقا
أوامر العمل والقرارات مهمة للموظف في عمله .	5	4	3	2	1
عادة الاجتماعات أكثر عمليا للموظفين.	5	4	3	2	1
الاحتراف في المهنة عند الرجال يكون أكثر من عند النساء.	5	4	3	2	1
عادة يحل الرجال المشاكل بعيدا عن العاطفة عكس ما يكون عند النساء.	5	4	3	2	1
عادة يتطلب حل المشاكل التنظيمية نظرة قوية تكون عند الرجال.	5	4	3	2	1
من الأفضل تولي الرجال المستويات العليا في المنشأة بدلا من النساء.	5	4	3	2	1
من الواجب أن يتخذ المسنول أكثر القرارات بدون استشارة الموظفين .	5	4	3	2	1
من الضروري للمسنول استخدام السلطة والقوة للتعامل مع الموظفين.	5	4	3	2	1
من الواجب على المسنول ألا يسأل عن آراء الموظفين إلا نادرا.	5	4	3	2	1
من الواجب على المسنول تجنب عمل علاقات اجتماعية مع الموظفين.	5	4	3	2	1
من الواجب على الموظفين ألا يختلفوا مع قرارات المسنول.	5	4	3	2	1
من الواجب على المسنول ألا ينتدب أو يوكل بمهام مهمة إلى الموظفين .	5	4	3	2	1

شكرا لشخصكم الكريم