APPLYING THE OTE MODEL IN DETERMINING THE E-COMMERCE ADOPTION ON SMEs IN SAUDI ARABIA

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ABSTRACT

The objective of this paper is to examine factors that influence the adoption of e-commerce among small and medium enterprises in Saudi Arabia using the OTE model developed by Tornatzky and Fleischer. Nine hypotheses were formulated to answer the following objectives of study; (i) to determine the significant relationship between organizational context and the e-commerce adoption, (ii) to determine the significant relationship between technology context and the e-commerce adoption, and (iii) to determine the significant relationship between environmental context and the e-commerce adoption. A quantitative research design based on the questionnaire survey was used to collect the data. A total of 1150 questionnaires were mailed to the SME owner/managers in the regions of Riyadh, Eastern Saudi Arabia, and Makkah, and 400 useable responses were received, giving a response rate of 34.78 percent. The findings reveal that owner's attitude, firm size, information intensity and competition intensity had positive significant relationship with e-commerce adoption among SMEs in Saudi Arabia while owner's knowledge and relative advantage had a significant negative relationship with e-commerce adoption. Other variables such as owner's innovativeness, compatibility and complexity of technology had shown no significant relationship with e-commerce adoption. These findings may be of help to SME owner/managers and the policy makers in Saudi Arabia in finding solution for the successful implementation of e-commerce in the SMEs.

Keywords: *Small and medium enterprises (SMEs), E-commerce adoption, organization, technology, environment, OTE model*

1. INTRODUCTION

The information and communication technology has rapidly and radically changed the way various organizations conduct their businesses. The use of e-commerce opens up the opportunity for firms to reach their customers anytime and anywhere, and enable a firm to gain a competitive advantage over its competitors (Soliman & Janz, 2004; Li, 2008). E-commerce involves the trade of goods and services in an electronic manner, such as by computer-based transactions from businesses that utilize internet networking systems as well as several technologies that are digital in nature (Laudon & Laudon, 2007). However, the small and medium enterprises (SMEs) are generally slower in adopting this technology compared to large firms, and this makes SMEs more vulnerable to changing economic conditions as they may have relatively lower level of competitiveness. In addition, SMEs are considered as major economic players and a potent source of economic growth for most nations (Taylor & Murphy, 2004; Ramdani, Kawalek & Lorenzo, 2009). Thus, SMEs should

have greater ability than the large firms in the adoption of administrative services and guidance to new and innovative ideas because of their flexibility (Rao, Metts & Monge, 2003).

The advantages of e-commerce adoption are numerous and have been well acknowledged empirically by numerous studies. It can help SMEs to gain better access to information and expertise, reach new markets and customers, and manage the business more efficiently and effectively (Wilcott, Kamal & Qureshi, 2008), and create innovative products and be competitive (Barba-Sanchev, Matinez-Ruiz & Jimenez-Zaroo, 2007). E-commerce adoption can also lower production and labour costs, add value to product and services, increase a firm's competitive advantage (Nguyen, 2009; Premkumar, 2003), and enhance the business process (Acar, Kocak, Sey & Arditi, 2005). Thus, the use of e-commerce by the SMEs is a challenge in both developed and developing countries. This paper considers the challenges faced by SMEs in Saudi Arabia in adopting e-commerce to improve their businesses. To be competitive in the globalization era, SMEs in Saudi Arabia also need to develop new strategies and employ new technologies.

2. SMEs IN SAUDI ARABIA

SMEs represent more than 93 percent of the total business establishments in Saudi Arabia (Ismail, 2004). Their role in the economic development become more important after Saudi Arabia joined the WTO, where the businesses require more technical expertise than in the past. E-commerce activities of SMEs are determined by the extent to which they use the technology to coordinate their international and inter-regional operations. However, like their counterparts in most countries, SMEs in Saudi Arabia also face various obstacles in the adoption of technology, particularly the e-commerce (Li, 2008). The main reasons cited for the non usage of e-commerce among the SMEs are due to a lack of training facilities, and also their belief that there is no need for the use of technology in their work (CITC, 2007). Therefore, efficiently adopting the technology among the SMEs has become a national agenda. The government has initiated the essential policy framework for a nationally comprehensive ICT and or e-commerce strategy that SMEs 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). To accelerate the adoption of this technology, the policy makers are also searching for answers about the important factors that would influence the SMEs to adopt the e-commerce. The Tornatzky and Fleischer's OTE Model, which is rooted in the specific organizational, technological, and environmental contexts of a firm, has been widely used in studies on adoption processes of e-commerce by the SMEs (Kuan & Chau, 2001; Ramdani & Kawalek, 2009; Premkumar & Robert, 1999). This study intends to employ the OTE model to determine which factors are more likely to influence the SMEs in adopting e-commerce.

3. OBJECTIVES OF THE STUDY

The objective of this study is to determine the relationship between the organizational, technology and environmental contexts and e-commerce adoption among SMEs in Saudi Arabia. The characteristics in these contexts seem to be the primary focus of many studies on SMEs. Specifically, the objectives of this study are:

1. To determine the significant relationship between the dimensions of organization (firm size, owner's attitude, owner's innovativeness, owner's knowledge) and e-commerce adoption among SMEs in Saudi Arabia,
2. To determine the significant relationship between the dimensions of technology (relative advantage, compatibility, complexity) and e-commerce adoption among SMEs in Saudi Arabia, and
3. To determine the significant relationship between the dimensions of environment (competition intensity, information intensity) and e-commerce adoption among SMEs in Saudi Arabia.

4. RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

Figure 1 illustrates the proposed research model which hypothesized that organizational, technology and environmental factors influence the e-commerce adoption. The research model development and hypotheses are discussed below:
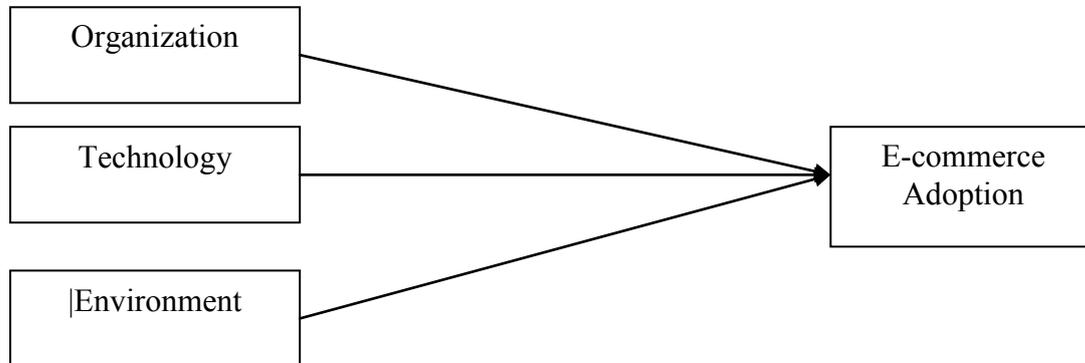

Figure 1
Proposed research model

4.1 Organization and E-commerce adoption

One of the most vital elements that will influence the adoption of e-commerce technology by SMEs in Saudi Arabia is the nature of the firm, including the different characteristic elements manifested within the organization such as the firm size, and owner/manager's attitude and innovativeness.

Firm Size

Firm size is one of the most influential factors of internet adoption among SMEs (Karakaya & Khalil, 2004). The size not only influences a firm's ability and readiness to adopt e-commerce, it also influences the extent to which technology will be adopted by the firm (Chang-Shuo, 2006). Thus, 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 with a large amount of transactions and data is also 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). Thus, the following hypothesis:

H1a: There is significant relationship between firm size and the e-commerce adoption among SMEs.

Owner/manager's Attitude

The adoption of e-commerce relies heavily on the acceptance of the technology by the business owners (Lubbe & Heerden, 2003). If the owner does not identify with the usefulness of the technology or has limited understanding of its potential then naturally the owner will be reluctant to adopt e-commerce. Previous studies have also found that management's attitude and support of the owners had a positive relationship with the e-commerce adoption (Seyal & Rahman, 2003; Levy & Powell, 2003; Chang-Shuo, 2006). The need for commitment and support from the owners or top management during the process of assessment of the innovation or technology is of utmost importance. This commitment and support ensures that there is an obligation within the resources, which in turn will create conducive environment within the firm for the adoption process of the technology. The following hypothesis is thus postulated:

H1b: There is significant relationship between owner/manager's attitude and the e-commerce adoption among SMEs.

Owner/manager's Innovativeness

Owner's innovativeness was found to be the strongest determinant for the adoption of information systems (Lee & Runge, 2001), while it also affected the cultural dimensions (Thatcher, Srite, Stepina & Liu, 2003). An innovative owner will definitely identify the advantages of incorporating e-commerce into the business, and accordingly be able to create new benefits through an innovative utilization of the e-commerce technology (Sanchez, 2002; Al Qirim, 2005). Therefore, the following hypothesis is formulated:

H1c: There is significant relationship between owner/manager's innovativeness and the e-commerce adoption among SMEs.

Owner's Knowledge

The technological knowledge of the owner can influence the adoption of e-commerce (Dubelaar, Sohal & Savic, 2005). If the owner is well-versed with the 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) found that lack of knowledge was the main barrier in the use of e-commerce and ICT among SMEs, while Mallah (2003) acknowledged that the relationship between the status of e-commerce in the SMEs and the perception of lack of knowledge as a barrier is statistically significant. Similarly, Chang-Shuo's (2006) study found that the CEO's technology knowledge had a significant relationship with e-commerce adoption among SMEs. Thus, the following hypothesis:

H1d: There is significant relationship between owner's knowledge and the e-commerce adoption among SMEs.

4.2 Technology and E-commerce adoption

The technology context represents the pool of technologies available to a firm for adoption. These can be both the technologies available on the market and the firms' current equipment (Scupola, 2009). The decision to adopt a technology depends not only on what is available on the market, but also on how such technologies fit with the technologies that a firm already possesses (Tornatzky & Fleischer, 1990; Rogers, 1995) such as relative advantage (perceived commerce benefits and impact), compatibility (both technical and organizational), and complexity (ease of use or learning electronic commerce).

Relative Advantage

Relative advantage is the extent to which the potential adopters and the customer perceive the new idea or innovation 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. It describes the amount of benefits and detriments a firm will experience for adopting or rejecting a new innovation or technology. 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). It is 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:

H2a: There is significant relationship between relative advantage and the of e-commerce adoption among SMEs.

Compatibility

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 (Vanderslice, 2000). If the firm has to make minimal changes or adjustments for the new innovation, then there naturally will be less resistance to the adoption. Compatibility is also investigated on how the new technology will fit with the experiences of the potential adopters and enhance their tasks. Resistance to change is one of the common elements faced by most firms when it comes to adoption of new ideas and technologies (Al-Qirim, 2007). If the adoption of any new technology requires minimal changes within the firm, its values, culture, working process, and infrastructure, then it is more likely for the firm to adopt the new technology. Grandon and Pearson (2003) found that the compatibility was statistically significant as determinants of e-commerce with a firm's culture and values. The following hypothesis is thus postulated:

H2b: There is significant relationship between compatibility and the e-commerce adoption among SMEs.

Complexity

Complexity relates to the level of ease with which the e-commerce technology can be understood by the firms (Vanderslice, 2000). The adoption of an innovation, as in e-commerce technology, depends on the time the firms take to understand the intricacies of 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. Al-Gahtani (2003) found negative significant relationship between complexity and computer adoption in Saudi Arabia, while Seyal and Rahman (2003) found no association between the two. Chang-Shuo (2006) also found that the CEO's perceptions of complexity of e-commerce, and the extent of e-commerce adoption were statistically insignificant. Thus, the following hypothesis:

H2c: There is significant relationship between complexity and the e-commerce adoption among SMEs.

4.3 Environment and E-commerce adoption

Information Intensity

The rapid advancements made by information technology have changed the policy of firms who conduct businesses, especially regarding selling their products and services. Most of these products come with information regarding the characteristics, nature and method of usage. The more complex the product is, the more information is required to describe the product and service of the firms (Malone, Yates & Benjamin, 1987). SMEs in a more information-intensive environment are more likely to adopt e-commerce technology (Pavic, Koh, Simpson & Padmore, 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 industries. Hence, SMEs that are oriented to the service industry are more likely to adopt e-commerce technology (Thompson & Yujun, 2003). Al-Qirim (2007) who investigated the impact of information intensity on the adoption of e-commerce among SMEs in New Zealand found that the information intensity was influenced by the adoption of web-sites. Thus, the following hypothesis is formulated:

H3a: There is significant relationship between information intensity and the e-commerce adoption among SMEs.

Competition Intensity

Porter (2008) identified five competitive forces that shape business strategy; new entrants, threat of substitute, bargaining power of customers, bargaining power of suppliers, and rivalry among current competitors. He also suggested that the adoption of IT will change the competitive environment in three ways; by changing the structure of the industry, changing

rules of competition, and giving businesses new methods by which to gain competitive advantage over their competitors (Porter, 2001). Studies have shown that intensity of competition is also associated with the degree of e-commerce adoption (Lertwongsatien & Wongpinunwatana, 2003; Forman, 2005; Iacovou, Benbasat & Dexter, 1995; Dos Santos & Peffers, 1998). Sandy and Graham (2007) who examined the factors that influenced the extent of the e-commerce deployment found that competitive pressure was a major factor affecting e-commerce among SMEs. In the context of Saudi Arabia where the market is relatively small, the SMEs will have a low cost alternative in e-commerce to advertise their products and services on a global scale, as well as finding suitable business partners around the globe. The following hypothesis is thus postulated:

H3b: There is significant relationship between competition intensity and the e-commerce adoption among SMEs.

5. METHODOLOGY

5.1 Sampling

The sampling frame of this study comprised of all SMEs operating in the Kingdom of Saudi Arabia, irrespective of whether they were using e-commerce applications or not. The sampling frame consisted of 78,488 firms. A SME is a firm or business that employs not more than 250 workers. There firms are distributed among thirteen regions across the Kingdom. Most of these firms were concentrated in the three main areas namely; Riyadh, Eastern Saudi Arabia and Makkah. This study used a self-administered questionnaire survey. The questionnaire was mailed to the owner/managers of the firms. Owner/managers were targeted as respondents of this study because they are likely the key informants who are directly involved in the overall running of the business. As such they are in better positions to understand the current operations and future trend of the firms.

A total of 1150 questionnaires were sent to the owner/managers who were systematically and randomly selected from the population in the sampling frame. Direct phone calls as a reminder of those respondents that delayed in responding were made to increase the response rate. A total of 423 were finally received, out of which 400 were usable resulting in a response rate of 34.78 percent. This is relatively high for a mail-survey research (Sekaran, 2003).

5.2 Scale Reliability

The instruments used in this study were developed from prior research and previously tested for reliability. Some of the questions used were slightly modified to make them more relevant to the purpose of the study. Table 1 below shows that all the constructs have Cronbach Alpha values of more than 0.7 which is higher than recommended by Hair, Black, Babin, Anderson and Tatham (2006). Thus the constructs were deemed to have adequate reliability.

Table 1
The number of items of the variables and alpha values

Variable	No of items	Cronbach's Alpha
Owner's attitude	4	.861
Owner's innovativeness	11	.737
Relative advantage	4	.767
Compatibility	3	.748
Complexity	4	.747
Information intensity	3	.724
Competition intensity	3	.856
E-commerce adoption	7	.946

5.3 Factor Analysis

Construct validity in this study was validated through factor analysis. Principal component analysis was applied to determine how and to what extent the items are linked to their underlying constructs (Zhang, Waszink & Wijngaard, 2000). According to Hair et al (2006), factor loadings greater than 0.30 are considered as significant; loadings of 0.40 are considered as more important, while loadings that are greater than 0.50 are very significant. Thus a factor loading of 0.40 was used as the cut off point for this study. From Table 2a, all three factors and most the items were loaded on the correct factors. However, five items under owner's innovativeness did not sufficiently loaded on the correct factor and were removed. For Table 2b, three factors and all items were loaded on the correct factors, and all of these items were retained. Similarly, all three factors and items in Table 2c were retained for subsequent analyses.

Table 2a
Factor Analysis (Organizational Context)

Variable	Scale Item	Factor 1	Factor 2
Attitude	1	.676	
	2	.559	
	3	.729	
	4	.660	
Innovativeness	2		.667
	4		.834
	5		.757
	7		.730
	8		.713
	9		.430

Table 2b
Factor analysis (Technological context)

Variable	Item	Factor 1	Factor 2	Factor 3
Relative advantage	1	.784		
	2	.637		
	3	.827		
	4	.698		
Complexity	1		.616	
	2		.771	
	3		.787	
	4		.859	
Compatibility	1			.768
	2			.825
	3			.725

Table 2c
Factor analysis (Environmental context)

Variable	Item	Factor 1	Factor 2	Factor 3
Information intensity	1	.616		
	2	.863		
	3	.744		
Competition intensity	1		.442	
	2		.825	
	3		.423	
E commerce adoption	1			.777
	2			.882
	3			.927
	4			.812
	5			.775
	6			.500
	7			.593

6. RESULTS AND DISCUSSION

6.1 Sample Characteristics

A demographics profile of the respondents is illustrated in Table 3 below. The geographic location of the firm is 44.0 percent in Riyadh, 33 percent in Eastern Saudi and 23 percent in Makkah. Majority of the firms have more than 25 employees (61 percent). More than 22 percent of the firms have been operating for over two decades, 29.75 percent have been in the business between 11 and 20 years, while only 25 percent of the firms have been established between 5 and below years. The profile of respondents was also sorted by gender, age and education level. A significant number of respondents were male and only 35 (8.75 percent) of them were female. Most of them were at the age of 40 years and above, and majority of them attained the academic qualification higher than the high school level (79 percent).

Table 3
Characteristics of Respondents

Characteristics	Frequency	Percentage
Gender		
Male	365	91.25
Female	35	8.75
Age (years)		
18-29	62	15.50
30-39	84	21.00
40-49	153	38.25
50-59	74	18.50
60 and above	27	6.75
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
Location of firm		
Riyadh	176	44.00
Eastern	132	33.00
Makkah	92	23.00
Number of employees		
25 and below	156	39.00
26-50	102	25.50
51-100	46	11.50
101-150	29	7.25
151-250	67	16.75
Tenure in business (years)		
5 and below	100	25.00
6-10	91	22.75
11-15	64	16.00
16-20	55	13.75
Above 20	90	22.50

6.2 Multiple Regression Analysis

The results for the multiple regression analysis are presented in Table 4 below. When the independent variables were considered simultaneously in the regression model, four variables had shown strongest positive significant relationship with e-commerce, where attitude (β = 0.27, $p< .001$), competition intensity (β= .23, $p< .001$) information intensity (β= 0.20, $p< .001$) and size of firm (β = 0.16, $p< .001$). Two of the variables became significant negative predictors, where relative advantage (β= -.24, $p<.001$) and knowledge (β= -.12, $p<$

.05), while owner's innovativeness, compatibility and complexity of technology had shown no significant effect on the e-commerce adoption. The results of the regression analysis supported Hypotheses 1, 2, 4, 5, 8 and 9, but did not support Hypotheses 3, 6 and 7.

Table 4
Multiple regression analysis

Predictors	B	SE	Et	p	Sig.
Size of firm	0.10	0.03	.16	3.51	.000***
Owner's attitude	0.44	0.10	.27	4.53	.000***
Owner's innovativeness	0.07	0.05	.07	1.40	.162
Owner's 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***

* $p < .05$, ***$p < 0.001$

The results of the regression analysis provide support that there were significant positive relationships between the firm size, owner's attitude, competition intensity and information intensity and the e-commerce adoption. Firm size was also one of the most determinant factors of e-commerce adoption among SMEs in Saudi Arabia. In addition, it had the strongest positive significant relationship with e-commerce adoption. This shows that size can influence the extent to which technology will be adopted by the firm. The larger the firms, the higher will be the adoption levels of technology, while the smaller firms may incline to adopt technology at the lower level (Cragg & Mills, 2009). The findings of this study are also in line with those of Teng (2000), Dandridge and Levenberg (2000), Karakaya and Khalil (2004), Al Qirim (2005) and Chang-Shuo (2006). The owner/manager's attitude was also found to be significantly related to 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 he or she is well aware of the intricacies of the computers and has some knowledge of technology and how to reap its benefits, then the business is likely to adopt e-commerce. The findings corroborate previous studies such as Seyal and Rahman (2003), Levy and Powell (2003), Chang-Shuo (2006), and Nasco, Toledo and Mykytyn (2008). They all found that the management's attitude and support had positive relationship with e-commerce adoption.

The positive and significant relationships between the environmental contexts and the e-commerce adoption among SMEs in Saudi Arabia were also supported. Competition intensity and information intensity both had strong positive relationships with e-commerce adoption, and thus higher levels of competition and information intensities were related to higher e-commerce adoption. According to Alzougool and Kurnia (2008), the environmental context is conceded to be one of the important factors that should be studied by any researcher who researches e-commerce adoption due to its critical role in market competition. The competition intensity had been examined in previous studies (eg. Al-Qirim, 2007; Kuan & Chau, 2001; Scupola, 2003; Lertwongsatien & Wongpinunwatana, 2003; Grandon & Pearson, 2004). They all found that competition intensity had a positive relationship with e-commerce. The result of this study is in line with those studies, and the owner/managers of SMEs in Saudi Arabia should focus on understanding the competition intensity in the market by studying the trend and expectations of the customers in the market. Recognizing the customer as an integral part of the business is crucial. Thus, by giving attention to the opinions of customers on the products and services is a key for the firm survival in the intense competition in the market. Similarly, if the information intensity was high in a firm, then it is more likely for the firm to adopt e-commerce. The finding of this study also corroborates with those of previous researchers who found that information intensity had a positive relationship with e-commerce (Al-Qirim, 2007; Chang-Shuo, 2006). Therefore, the owner/managers 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, both domestic and foreign.

The results of the regression analysis also found the existence of negative relationships between owner's knowledge and relative advantage and the e-commerce adoption. These two findings contradicted those previously found in the literature. Surprisingly, higher levels of knowledge and relative advantage were related to lower e-commerce adoption among the SMEs in Saudi Arabia.

Hypotheses 3, 6 and 7 of this study were not supported. The result reveals that there were no significant relationships between owner's innovativeness, compatibility and complexity of technology and the e-commerce adoption. Interpretation of these findings could lead to two possibilities regarding the owner's innovativeness among SMEs in Saudi Arabia. On one hand, it could be used alone to determine its impact on the adoption of e-commerce, and on the other hand it could be used in the same context with other factors taking into account the desire of the owners to accept new thing that will improve their budget against unexpected risks in the future. However, the result of this study is not in line with previous studies such as those of Thong (1999), Thong and Yap (1995) and Al Qirim (2005). But it supports the study by Chang-Shuo (2006) who found that innovativeness was not statistically significant to the extent of e-commerce adoption among SMEs. On compatability and the e-commerce adoption, theses findings contradict previous studies by Teo and Ranganathan (2004), and Seyal and Rahman (2003). However, the result corroborates with the study by Al-Qirim (2007) who found that compatibility was not statistically significant with the extent of e-commerce adoption among the SMEs. The findings also confirmed previous studies that compatibility is dependent on the innovation adoption among SMEs which require minimal changes within their firms, their value culture, work processes, and infrastructure (Lertwongsatien & Wongpinunwatan, 2003; Al-Qirim 2007). The seventh hypothesis of this study was also not supported. The result reveals that there was no significant relationship between complexity and the e-commerce adoption. However, these results concur with those prior research such as Grandon and Pearson (2004), Seyal and Rahman (2003), Chang-Shuo (2006), and Al-Qirim (2007).

7. CONCLUSION

The results of this study shed an interesting insight about e-commerce adoption by SMEs in Saudi Arabia. This study used the OTE model developed by Tornatzky and Fleisher (1990) to determine the contexts affecting the adoption of e-commerce in the SMEs. This OTE model has been investigated by a number of researchers who developed perceptions based on organizational, technology and environmental frameworks. This model has also been suggested to have the ideal structure appropriate for research and study of factors that are known for e-business success. Thus, the results of this study have provided evidence that support the validity and reliability of the OTE framework. This study may not only expand the current body of knowledge on the e-commerce, but has also provided great potential by advancing the understanding on the association between the OTE model and e-commerce adoption in Saudi's SMEs. By understanding the e-commerce adoption, SME owner/managers can continuously look for ways to improve their competitive ability and utilizing the e-commerce adoption as a strategic tool to help them achieve just that.

This study is not free of limitations. First, given that findings from this study were cross-sectional, future research should be undertaken to examine the causality effect across time which requires the use of longitudinal method. Second, only a single research method was employed and future research could extend this study that combine qualitative and quantitative approaches. Finally, since this study employed one informant per organization and self reports obtained from subjective perceptions, social desirability bias could also be present. Nevertheless, confidentiality has allowed this bias to be minimized.

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