The adoption of information and communication technology by small and medium enterprises in Oman: Case of Dhofar region

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Keywords

Abstract

The vital theme of this paper is to examine and identify the focal possible challenges and constraints faced by small and medium enterprises in the use of Information and Communication Technology (ICT) in Dhofar Region in the Sultanate of Oman. The heavy dependent of Sultanate of Oman on oil has led to the progress of alternative procedure which limited state involvement while promoting the individualization of markets and then establishment of more Small and Medium Enterprise (SMEs). Current uncertainties in the decrease of oil prices and also in the worldwide business environment continue to encourage activities in Oman's SMEs sector to the level that both the government and SME owners have developed policies to help them raise their contribution in the economy. SMEs continue to be essential in all economies because they shape the basis of economic recovery and development.

The paper has applied Technology Acceptance Model (TAM) which was originally initiated by Davis (1989). The study uses both quantitative and qualitative research techniques. The qualitative method is investigative, so data will be collected through wide literature reviewed from official reports and researches to develop a clear picture of the problem. Then for quantitative questionnaire is developed and distributed to the SME owners. The study has used random sampling method.

The findings indicate that owners of SMEs in Dhofar region are aware of the perceived benefits (usefulness) of ICT adoption. In addition to that, in the sample surveyed, perceived benefit is found to be the most important factor affecting ICT adoption. While perceived ease to use, is found to be insignificant in influencing ICT adoption.

Introduction

Nowadays the business in the whole world has been affected by usage and applications of Information and Communication Technologies (ICT). The ICT has its fast impact on how production can be changed, work and business techniques and consumption pattern in and between projects and customers. Denni (1996) assured that any business must carry ICT in their business functions and gain the benefits they present. (Kazi, 2007) argue that in advanced economies (developed countries) Small and Medium enterprises (SMEs) represent almost more than half of all companies and more than half of all employment. These days SMEs are more and more using and adopting ICT because of easy access to Personal Computer, low cost of ICT products and efficiency. Alberto and Fernando (2007) argued that, the application of ICT can advance business competitiveness given that internet offer   many opportunities for SMEs to compete similarly with large companies. But one of the growing concern of all business whether large or small is ITC security. According to the Global

IT Security Risk Survey by Kaspersky, nine out of 10 companies had already been the target of a cyber attack. In contrast to this are the results of Deutsche Telekom's Cyber Security Report: According to the report, more than half of decision-makers in the political and economic sectors only assume a slight risk of serious damage caused by hacker attacks. Very wrong! In the spring of 2013, hackers were able to abscond with around GBP 1.3 million after breaking into the IT systems of a British bank. In the same year, a gang in the USA perpetrated an online bank robbery to the tune of EUR 34 million. And during the 2013 Christmas shopping season in the USA, 160 million data records were stolen from customers, including credit card data and PINs.

As the global economy keep on to shift toward enlarged integration due to progress in information communications technology, and the growing drop in trade obstacles, some of the supreme chances for small businesses will derive from their ability to participate in the regional and international markets (Mutula and Brakel, 2006). Implementation of the ICT is believed to be a way to allow these businesses to compete on a universal level, with enhanced effectiveness, and nearer customer and supplier associations. In this regard, SMEs should deem information and communication technology (ICT) as vital process in their companies to acquire competitive advantage from the global markets. In addition, ICT is a provider of SME which might assist them to access and add to in order to improve its competitiveness.

Corporations and companies vary in size, site, segment, age, possession formation, financial concert, adulthood, and management approach. Within literature, there are different concepts of what compose an SME, and this is accompanied by geographical, framework and sectoral differences. It is perfect to undoubtedly define an SME in framework of the research. The European Commission defined an SME due to microeconomic characteristics, like earnings, annual balance sheet total and number of workers. In Oman, SMEs can be classified as micro, small and medium enterprises (referred to as SMEs). In this paper we have implemented the Ministry of Industry and Commerce Act of 2015 definition. Enterprise with fewer than 6 employees and annual turnover below OR 100000 are considered "micro enterprise". Enterprise with a number employees ranging between 6-25 and annual turnover ranging between OR 100000 and less than OR 500000 are considered "small enterprise". Enterprise with a number employees ranging between 26-99 and annual turnover ranging between OR 500000 and less than OR 3000000 are considered "medium enterprise".

Statement of the problem

The heavy reliant of Oman on oil has led to the development of another procedure which restricted government involvement while encouraging the formation of more Small and Medium Enterprise (SMEs). The performance of these SMEs is not to the level that can diversify the economy and achieve government objectives. One way of improving the performance of SMEs is adoption of ICT. Therefore, this paper investigates the factors affecting the adoption of ICT in SMEs in Oman case of Dhofar region.

Objectives of the study

The main objective of this manuscript is to examine to what extent SMEs in Dhofar Region in Oman adopting ICT, because SMEs provide a venue for motivating growth and use of emerging technologies in other areas. Other objectives can be summarized as follow:
1- Understanding the significance of ICT to SMEs in Dhofar Region.
2- To investigate the factors influencing ICT adoption by SMEs in Dhofar Region with more emphasis is given to the effect of perceived benefits (usefulness) and ease to use.

Research questions

The study
1- What is the impact of perceived benefits (usefulness) on the ICT adoption by SMEs?
2- How perceived ease of use can affect decision of adopting ICT by SMEs in their business?

Literature review

Reviewing the previous literatures reveal that the adoption of Information and Communication Technology (ICT) by Small and Medium Enterprises (SMEs) is still less than the expected levels (Hashim, 2008; Dharmalingam, and Kannabiran, 2011). Many studies identified different determinants of ICT adoption in SMEs including lack of knowledge about the potential of IT, lack of resources such as financial and expertise (Ndubisi and Kahraman, 2005; Duan, Deng, and Corbitt, 2012; Dharmalingam, and Kannabiran, 2011). Other studies have also focused on determinants may affect the ICT adoption in SMEs as it shown in previous studies. An important variable is awareness of changes in business environment many earlier studies (Koh and Maguire, 2004; Taylor and Murphy, 2004) show that SMEs are generally unaware of the potential of ICT in enhancing their business operation and environmental factors. Another determinant is the role of the CEO/Owner CEO/owner involvement, which it is essential for establishing appropriate ICT goals, identifying critical business information needs, allocating the financial resources and managing the implementation phase. CEO's knowledge of IT has also been identified as a key factor influencing adoption and the championing of IT, while lack of knowledge appears to inhibit uptake (Bassellier, Benbasat, and Reich, 2003). Multi opinions about the effect of the size of the enterprise on adopting ICT in SMEs are considered. However, size may not be a significant predictor of ICT adoption (Teo, and Pian, 2003; MacGregor, 2004; Bajwa, Lewis, Pervan , and Lai, 2005). Whatever, this differs from industry to industry (Flint and Herbert, 2000). Regarding to our study, we will use technology acceptance model (TAM) to investigate the intention to adopt ICT by SMEs.

Perceived ease of use: Refers to the extent to which ICT is aligned with actual practices in the work and what individuals in the enterprise environment are believed in (Hsu, Kraemer, and Dunkle, 2006). Using ICT enhances the communications and interactions between the employees, so the data will be smoothly transferred within the enterprise (Zhu, Kraemer, and Xu, 2003; Alraja & Malkawi, 2015). In this paper, if the people in the SMEs think that their enterprise aligned with the requirements of information and communication technology, and they believe that adopting information and communication technology in their enterprises is easy, then they will be more likely to adopt it.

Perceived Benefits (usefulness) it refers to the benefits of using new and modern information and communication technology, such as flexibility, and cost effectiveness, comparing with actually used technology (Wang, and Cheung, 2004; Alraja & Malkawi, 2015). Further, in any business, if the people expecting more benefits from adopting the new information and communication technology this expectation will facilitate the process of adopting this new technology (Lina, and Lin, 2008). therefore, if the people in SMEs have the same expectation this will lead them to adopt the new information and communication technology.

Methodology

This study used primary data for analysis; accordingly, self-administered questionnaire was used to collect qualitative and quantitative data from SMEs in Dhofar Region to assess their adoption of ICT in their business. The population of this research consists of all SMEs in Dhofar Region. The sample size is 108 which represent 10% of total population (1074). Random selection method was used to collect data.

The response rate for the survey was 84.3% (91 responses). Cronbach alpha is measure to test reliability based on internal consistency of the questionnaire and the scales that used in this paper. As seen in table (1) the values of Cronbach alpha for perceived ease to use is 0.89 and for perceived usefulness is 0.98, which consider as a good indication of the internal consistency in the measurement.

Categories	Cronbach's Alpha
perceived easy to use	.890
perceived usefulness	.979

Table (1) Reliability tests

Source: own calculation base on questionnaire 2016

The research used factor analysis in order to determine the important factors that can affect the decision taken by SMEs owners related to adoption of ICT in their business (table 2). Eight components have an Eigen value exceed one (criterion value). In addition, component of perceived benefits account for 92% of total variability in the original variables while the factors identified for perceived ease to use explains 62% of the total variance.

Categories	Variables	Factors	
		1	2
Perceived ease to use	The procedure of using information and communication technology is understandable.	.997	
	It is easy for us to learn using the information and communication technology.	.826	
	It is easy to make use of information and communication technology	.889	
Perceived benefits (usefulness)	Using information and communication technology allow me to manage business operation in an efficient way.		.944
	Using information and communication technology allow me to increase labour productivity.		.894
	Using information and communication technology enables us to accomplish our organizational task more quickly.		.937
	The use of information and communication technology services improves the quality of business operation		.912
	Using information and communication technology advances our competitiveness.		.885

Table (2) Factor Analysis

Source: own calculation base on questionnaire 2016

Data analysis

The objective of this analysis is to identify the important factors that affect ICT adoption by SMEs in Dhofar. Table (3) (See Appendix 1), displays that the majority of the business surveyed are microenterprises (50.5%), 30.8% small enterprises while 18.7% are medium enterprises. 56% of these enterprises are in services industry. Table (3) also indicates that 41.6% of the SMEs were established during the last five years while 14.6 % established during the past 6 to 10 years and the rest of SMEs surveyed were started their business for more than ten years. 81.3% of the respondents are males while females represent only 18.7%. The majority of respondents are in the age group from 26 to less than 36 years which indicate that entrepreneurship culture are spread more among young generation. 59.3% of the respondents used more than one items of ICT in their company. To measure the sampling adequacy Kaiser-Meyer-Olkin (KMO) was estimated as 0.89 whish is above the recommended level (0.5). Frequency distribution analysis was conducted for demographic and basic characteristics of the respondents. Cross tabulation and regression analysis were used to analysis the factors that affect adoption of ICT on SMEs in Dhofar Region. Statistical Package for Social Sciences (SPSS) will be used for the analysis.

According to cross tabulation analysis; table (4) shows that the use of ICT in SMEs is increasing with levels of education of the owners and the year of establishment of the company (See Appendix 2).

Table (5) reveals the results for multiple linear regression analysis. The purpose of regression analysis is to test the relation between the dependent variable which is intention to adopt ICT and the independent variables; perceived ease to use and perceived benefits. The overall model is significant at the 1% level. The independent variables explain 90% of the variance in the ICT adoption. The independent variable perceived benefits have positive and significant at 1% level and also have more powerful effect on adoption; if perceived benefits increase by one adoption will increase by 0.943. Although perceived ease to use has positive effect on adoption but it is statistically insignificant.

Independent variables	Parameter estimate	t-value
Constant	.017	.515
Perceived ease to use	.027	.338
Perceived benefits	.934*	11.631
Adjusted R2	0.909	
F- Ratio	429.247	
Number of observations	91	

Table (5) regression analysis
Source: own calculation base on questionnaire 2016
* means significant at the 1% level.

Conclusion and recommendations

The aim of this paper is to examine factors influencing intention to adopt ICT in SMEs in Dhofar Region in Oman. The paper has applied Technology Acceptance Model (TAM) which was originally initiated by Davis (1989). The model developed to study the acceptance of the technology by individuals as well as by companies taking into consideration, essentially, both the benefits and the perceived ease of use of the technology. The results and findings of this paper exhibit positive relationship between perceived benefits and perceived ease to use from one side and ICT adoption from the other side. But perceived ease to use although it has positive relation but it is insignificant. It should be pointed out that this research was bound to Dhofar Region, which is not the most economically active municipal area in Oman, therefore any illation and repetition of the study in other municipality of Oman might give different results. Most of the empirical studies have some limitations, and this study is of no exception. The sample collected from SMEs in Dhofar Rejoin in Oman can limit the generalization of the results. Even though many technology adoption studies paying attention to the zone basis (Cloete et al., 2002), state based respondents, but using technology differ from state to state from overall population of SMEs. The size of the sample is also comparatively small. The study can be reinforcing by raising the sample size and counting contributors from other regions in Oman. If the sample size is increased we could get better results on dependent and independent variables.

The paper recommends the following:
1- Awareness programs about the importance of ICT adoption in improving the performance of SMEs should be conducted in Dhofar by the different bodies of responsibility.
2- Government support is considerably important in supporting adoption of ICT by SMEs to achieve the fruits of diversifications.

3- Most of the SMEs in this study did not have appropriate ICT expertise to decide on which ICT to invest in and to implement the new system.

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Appendix 1

Demographic variables		No of respondents	*percentage*
Gender	Male	74	81.3
	Female	17	18.7
Education level	read and write	7	7.7
	General diploma (grade 12)	24	26.4
	Diploma	10	11.0
	BSC	35	38.5
	Higher diploma, MSc and PhD	14	15.4
Age	less than 26	3	3.3
	from 26 to less than 36	58	63.7
	from 36 to less than 46	13	14.3
	from 46 and more	17	18.7
Type of Business	Handcraft	12	13.2
	Retail trading	28	30.8
	Real state and care rent services	19	20.9
	others	31	34.1
Establishment	less than one year	6	6.6
	1-5 year	31	34.1
	6-10 year	13	14.3
	11 and more year	39	42.9
ICT items used in the company	Website	3	3.3
	The company has email used for correspondents	4	4.4
	Data base	3	3.3
	computers	20	22.0
	internal network	1	1.1
	The company used more than one	54	59.3
	nothing	5	5.5
Number of employees in the company	one to 5 employees	46	50.5
	6 -20 employees	28	30.8
	more than 20 employees	17	18.7

Table (3) Characteristics of the sample
Source: own calculation base on questionnaire 2016

Appendix 2:

Education level	ICT items used in the company	Years of Establishment				Total
		less than one year	1-5 year	6-10 year	11 and more year	
read and write	computers	1	2	0	0	3
	more than one items	0	1	0	2	3
	nothing	0	0	1	0	1
	Total	1	3	1	2	7
General diploma (grade 12)	The company has email used for correspondents		0	0	1	1
	Data base		1	0	1	2
	computers		2	0	6	8
	more than one items		2	2	7	11
	nothing		1	0	1	2
	Total		6	2	16	24
Diploma	Website		1		0	1
	The company has email used for correspondents		1		0	1
	computers		0		2	2
	more than one items		2		3	5
	nothing		1		0	1
	Total		5		5	10
BSC	All items	2	13	5	13	31
Higher diploma, MSc and PhD	All items	3	4	4	3	14

Table (4) Use of ICT according to years of establishment and education levels
Source: own calculation base on questionnaire 2016