Factors Affecting Small Micro Medium Enterprises' (SMMEs) Adoption of E-Commerce in the Eastern Cape Province of South Africa

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Abstract

This paper presents the findings of a study on the factors that affect SMMEs ability to adopt E-commerce conducted in the Eastern Cape Province in South Africa. The study employed both quantitative and qualitative methods of data collection and analysis in order to ensure reliability and generalisability of the results. Qualitative data was first subjected to thematic analysis and content analysis to turn it to enumerative data. Eventually all the quantitative data was coded into SPSS for graphs and descriptive statistics. According to the findings the most significant e-business adoption variables in the province are security, prestige, government support, vision and the need to service niche markets.

Keywords: Small Micro Medium Enterprises, E-Commerce

1. Introduction

E-business is the new model of doing business which provides significant benefits like cost savings, quick execution of business transactions and promotes globalisation of business activities thereby dismantling obstacles to markets penetration. However, according to studies done, small, micro and medium enterprises (SMMEs) in South Africa are moving very slowly to adopt the phenomena as compared to large enterprises. 'Global interconnectivity is a tsunami event, a tidal wave of cataclysmic change sweeping the world' (Siegal, 1999:12). In order to survive this interconnectivity tsunami, business enterprises whether large or small, ought to have a paradigm shift in the way they relate internally and externally. For decades, commerce has been based on the concept of customers coming to brick and mortar establishments to conduct their businesses. They have placed orders, received products, paid for them and finally taken their products with them. Alternatively, they

have placed their orders, had them delivered, been invoiced and then paid for them. The advent of the telephone meant that orders could be placed from a distance, but all business transactions still involved traditional brick and mortar establishments.

The advent of the Internet and the Worldwide Web in the early 1990s brought about electronic business (or electronic commerce), which is considered the modern way of doing business. The commercialisation of the Internet transformed the use of information and communication technologies (ICTs) in the business world. Over this period it was estimated that hundreds of billions of dollars have been spent on e-business (Sarner, 2004:10). According to Fletcher, Bell and McNaughton (2004:4), e-business refers to the application of ICTs to processes within the firm, and possibly to transactions with customers and suppliers. It is important to note that e-business involves several stakeholders, including the business that concludes the transactions, its customers and suppliers.

The major forms of e-business are:

- Business to Customer (B2C) - the use of ICT to enable forms of commerce between a business and its customers (Phan, 2003:581).

- Customer to Business (C2B) - the use of ICT to enable business communication between customers and businesses (Phan, 2003:581).

- Business to Business (B2B) - the use of ICT to enable forms of commerce between a business and its suppliers (Jones and Tilley, 2003:3).

The use of the Internet for commercial activities (e-business) means businesses are no longer confined to brick and mortar establishments; business transactions can now be concluded timeously; transaction costs are reduced and distance as a barrier of doing business is eliminated as almost every business becomes globalised.

2. E- business in South Africa

Large enterprises in South Africa, just like their counterparts in developed and similar developing countries, have to a large extent accepted e-business. However, small firms in the country are still shy of the phenomenon. The South African government is trying to improve the economic contribution of SMMEs. The government realised that for small firms to make a meaningful contribution they need to change their business models to e-business. In pursuit of that, the government came up with a National ICT Vision which promotes the adoption of e-business by once disadvantaged enterprises in all the country's economic sectors. The Department of Trade and Industry (DTI, 2004) sets out the country's ICT vision as follows:

a)   South Africa can become a World Leader in the development, adoption and adaption of ICTs, and in the application and diffusion of these technologies in order to achieve social development and sustainable and equitable economic growth.

b)   The ICT revolution changes the way that economic life is conducted; by taking the path towards a knowledge based economy, the country can improve its competitiveness, raise its rate of economic growth, and facilitate significant job creation, if the country is systematically mobilised to join the revolution.

c)   The effective deployment of ICTs can reduce inequalities between rich and poor, and urban and rural communities, if the country can provide sufficient access to these technologies, and can empower the disadvantaged to exploit these technologies.

South African SMMEs are still lagging behind in adoption and implementation of the phenomenon. According to Goldstuck (2002:10) online retail in South Africa is "at a very early stage of its market penetration, and remaining deeply immature in its implementation." The finding is corroborated by a study conducted by the Department of Trade and Industry and Statistics South Africa, which established that "the use of internet for e-commerce, especially by SMMEs, is still in its infancy in South Africa" (Sunday Times Business News, 18 January 2004:3).

3. Theoretical background

Literature has examined reasons behind the adoption or the non-adoption of electronic business by small businesses. The categorisation of e-business adoption factors differ from one researcher to another. Some researchers (Cooper and Zmud, 1990; Fink, 1998) grouped the factors into technological, organisational as well as external factors while others (for example Damanpour and Damanpour, 2001) just categorised them as benefits and drawbacks of e-commerce adoption. Furthermore, some researchers proposed conceptual models of e-business adoption. Most of these studies on e-business adoption were based on Roger's (1995) Innovation Diffusion Theory.

This study was guided by Rogers' (1995) Innovation Diffusion Theory. Rogers (1995:5) defines diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system. According to the theory, innovation is relative to the adopter, and is described as any "idea, practice, or object that is perceived as new by an individual or other unit of adoption." Rogers found that early adoption was associated with three factors: importance, space, and time. More important places tend to adopt earlier in addition to places closer to an innovation who tend to adopt earlier than those further away. The rate of adoption follows an S-shaped logistic curve with slow increases in adoptions until a tipping point is reached when adoptions accelerate rapidly, then plateau and increase only slowly to reach the last adopters. Types of adopters may thus be characterised, in sequence, as innovators, early adopters, early majority, late majority, and laggards.

In Rogers' theory, diffusion requires four elements: an innovation (something perceived as new), a communication system (a transmission system from one individual, group, or society to another), a social system (which provides the domain for the diffusion process), and time (from awareness of innovation through to adoption saturation in the social system).

Diffusion theory thus rested on the effects of five factors (Rogers, 1995:5):

a) Characteristics of the innovation itself. These are complexity, compatibility with existing structure and methods, observability of benefits, relative advantage over existing forms, and trialability - the extent to which it can be tried out on an experimental or pilot basis;

b) Characteristics of communication channels. These are interpersonal, organisational and mass media;

c) Process characteristics. The process can either be voluntary or mandatory.

d) Characteristics of the social system, that is compatibility of the innovation with social norms; and

e) Characteristics of the change agents promoting diffusion.

The diffusion theory held that diffusions progress through five stages, which are:

i.   Knowledge (awareness of the existence of the innovation);

ii.   Persuasion (mobilising positive attitudes toward the innovation);

iii. Decision (securing commitment to adopt the innovation);

iv.   Implementation (operationalisation in use); and

v.   Confirmation (positive outcomes reinforce the process of diffusion).

The next section discusses the problem statement.

4. Problem statement

Despite e-business bringing numerous opportunities to businesses, according to literature, the adoption rate of e-business by SMMEs is lower in comparison to that of big established businesses. Dubelaar, Sohal and Savic (2005:251 - 262) outlined the common impediments to e-business adoption by small businesses identified from literature as follows:

• Internal resistance, including employee and management resistance to change;

• Unready customers;

• Lack of top management support;

• Technology deployment, including issues related to selection of appropriate technology and budgetary constraints;

• Internal constraints, including unsuitability of existing business processes for e-business cannibalisation of sales by Internet based channels;

• Information and technology (IT) infrastructure, including issues related to integration of legacy systems with new technologies;

• Unready business partners; and

• Generic e-business issues, including security and privacy.

Given a scenario of non-adoption and low adoption of e-business by small businesses in South Africa, there is a need to investigate the issues and reasons underpinning SMMEs adoption of e-business in the Eastern Cape Province. What instigated them to adopt? What held them back? Why have they been so reluctant to engage in a

form of commerce that appears to offer considerable benefits? Are they aware of possible benefits to be gained from adopting? What are the issues impacting upon them in their considerations? What factors enabled their adoption or acted as barriers to it? Are there steps that other interested stakeholders could take to facilitate the whole process for them? What issues impinged upon them once they have adopted? If these issues were identified, would it be possible to provide guidelines that would facilitate the adoption of e-business by SMMEs? These questions and others of a like prompted this research.

4.1 Research objectives

The primary objective of this research is to identify factors influencing the adoption of e-business by SMMEs in the Eastern Cape Province by investigating Buffalo City bed and breakfast adopters and non-adopters of e-business. The secondary objective was to find out whether education level is a significant variable in the adoption of e-business by SMMEs in the Eastern Cape Province.

4.2 Hypotheses

H_{01}: SMMEs in the Eastern Cape are facing impediments in their decision to adopt e-business.

H_{11}: SMMEs in the Eastern Cape are not facing impediments in their decision to adopt e-business. H_0: Incentives are encouraging SMMEs in the Eastern Cape to adopt e-business.

H_{12}: Incentives are not encouraging SMMEs in the Eastern Cape to adopt e-business.

Afolabi (2007) highlighted that *"By and large many SMMEs are often owned by close family relatives comprising husband, wife and perhaps their children, some who are educationally disadvantaged. Therefore, the poor literacy level of a promoter may have a significant effect on the adoption of e-commerce by the business."* Education is a strong e-business adoption variable in African developing countries because SMMEs are largely owned by family members whose main objective is to get a survival income from the business

It is therefore important to hypothesise education and test its significance separately as South Africa is a developing African country.

H_{03}: SMME owners with higher educational qualifications are more likely to adopt e- business.

H_{13}: SMME owners with higher educational qualifications are not more likely to adopt e-business.

5. Significance of the study

"In the Global Information Society, there is direct positive correlation between access to ICTs and socio-economic development. The government realises that ICT is no longer the consequence of development, it is rather a necessary precondition" (Audenhove, 1996:16). Since 1994, the government of the African National Congress (ANC) has been trying to improve the country's economic advancement through promoting the economic activities of SMMEs. The study therefore compliments the government's efforts by trying to evaluate how SMMEs can successfully adopt e-business to positively contribute to economic development. The adoption and implementation of e-business is no longer a business choice but rather the new way of doing business. It constitutes innovation as businesses are now becoming global and the adoption of this innovation is eliminating business and national boundaries, thereby acting as a strong competitive tool. The study will inevitably create awareness of the importance of this phenomenon amongst SMMEs.

The research eventually proposes policies and strategies to both SMMEs and policy makers to minimise or eliminate challenges associated with e-business adoption by SMMEs in the Eastern Cape Province. Thus, the study addresses the policy deficiencies in trying to improve the adoption of e-business by small firms in the province.

6. Methodology

6.1 Research Design

Previous e-business studies have utilised a combination of qualitative and quantitative approaches (Hinson 2006:126). The qualitative approaches have been used where deeper understanding has been sought in respect of particular e-business phenomena whilst quantitative approaches have been useful in cases where substantive data was available, and where the data lends itself to analysis (Hinson, 2006:127). Oyelaran-Oyeyinka and Kaushalesh (2004) in Hinson (2006:127) utilised quantitative methodologies in conducting e-business research in African contexts.

Both qualitative and quantitative research methods were utilised in this study due to the following:

a) Qualitative methods: to get a deeper understanding in respect of the actual variables in the South African context which act as drivers / impediments to the e-business adoption process in the Eastern Cape Province.

b) Quantitative methods: to make sure numerical data collected from the in-depth interviews can be statistically and numerically analysed.

6.2 Research Methods

To get an in-depth understanding of issues which act as drivers or impediments to e-business adoption by adopters, face-to-face personal interviews were conducted to collect the data. Personal interviews assist in probing to get the underlying reasons behind responses and the researcher gets a further understanding by observing body languages. Non-adopters of e-business were telephonically interviewed to get the real reasons behind the non-adoption and the wish to adopt. Telephone interviews were appropriate for non adopters as there was a need to collect less detailed data from non-adopters. Telephone interviews provide a simple variation of personal interviews (Lin, 1976:236-237).

6.3 Research Technique

The scientific technique was preferred to historical technique. Initially the topic and hypotheses were formulated. This was followed by conceptualising and operationalising the research problem. Eventually, data gathering and analysis as well as hypotheses testing were done.

6.4 Population

The population of the study is Buffalo City bed and breakfast SMMEs, inclusive of both adopters and non-adopters of e-business, which are registered with Small Enterprises Development Agency (SEDA). The SEDA database was obviously not the entirety of all the bed and breakfast SMMEs in the Buffalo City but was useful as it was difficult to quantify the actual number of small firms in this sector. According to SEDA there are 131 bed and breakfast SMMEs (population) in their database.

6.5 Sampling Procedure

Random sampling or (probability sampling) was used to ensure representativeness of the sample. According to De Vos (2002:366) probability sampling is "the sampling in which each potential respondent in the population has a same known probability of being selected."

6.6 Sampling Type

Simple random sampling was chosen so as to reduce researcher bias. A simple random sample is a subset of individuals chosen from a larger set (population). Each individual is chosen randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process, and each subset of individuals has the same probability of being chosen for the sample as any other subset of individuals (Yates, Moore and Starnes, 2008:21).

6.7 Sample Size

An online RAOSOFT sample size calculator was used to calculate the sample size. The RAOSOFT sample size calculator gives a sample size of 75. This is after assuming a margin of error of 5%, confidence level of 95% and response distribution of 87%.

6.8 Sampling Technique

Using simple random sampling, the researcher selected 50 SMMEs (adopters) that had adopted e-business and 25 SMMEs (non-adopters) that had not adopted e-business. During the sampling the SMMEs were telephonically conducted to determine whether the chosen enterprise was an adopter or non-adopter. The researcher initially planned to indiscriminately select 50 adopters from the population and it was assumed that after reaching the sample size of the adopters the researcher would have selected more than 25 non-adopters. The first 25 non-adopters that agreed to be telephonically interviewed constituted the sample size of non-adopters.

Generally, due to e-business exposure, adopters have better awareness of e-business issues therefore the researcher did not need to interview the same number of non-adopters. By including non-adopters it was possible to make inferences about all SMME owners.

6.9 Data Analysis Procedure

Quantitative (enumerative) and qualitative methods of analysis were applied. Initially thematic coding and content coding were applied to qualitative data to change the data to descriptive data. The purpose of the coding

was to classify responses into meaningful categories and then assign frequencies to the responses. Eventually, all the enumerated data was analysed using SPSS.

6.10 Reliability

The adopters' interview schedule has a Cronbach alpha coefficient of 0.762. This was after calculating the coefficient by using responses of 4 questions from 16 respondents. The non-adopters' interview schedule has a coefficient of 0.701 after using responses of 3 questions from 8 SMMEs. This shows that the two instruments' Cronbach coefficients are acceptable and therefore the measurements are valid and reliable.

7. Findings

Logistic regression was performed in order to accept or reject the hypotheses. As part of the analysis, the researcher specified the independent variables, as Gill and Johnson (1991:44 - 56) argued that in research there needs to be an emphasis on specifying the independent and dependent variables. The incentives and the impediments are the independent variables, on one hand, while adoption is the dependent variable. The independent variables were regressed against adoption at 95% confidence interval.

7.1 Impact of Independent Variables on Adoption of E-Business

Logistic regression was conducted to determine the relationships between all the independent variables on one hand and the adoption of e-business on the other hand. Moreover, the extent of the impact of the independent variables on the adoption was also analysed. In order to invalidate or confirm the hypotheses that incentives, impediments and education impact the adoption of e-business in the Eastern Cape Province, P values from the logistic regression were used to test the significance of all the independent variables. When the P value from the logistic regression is <0.05 it means the variable is significant (Pampel, 2000:9). Data from the logistic regression showing the significance (or insignificance) of independent variables is shown in the following Table 1.

Insert Table 1 about here

As seen in the table 1 not all incentives and impediments are significant. However, the majority of them are significant. The significant incentives and impediments in the table validate hypothesis H_{01} and H_{02}. Therefore the following hypotheses H_{01}: SMMEs in the Eastern Cape are facing impediments in their decision to adopt e-business and H_{02}: Incentives are encouraging SMMEs in the Eastern Cape to adopt e-business are accepted at 5% significance level.

Hypothesis H_{03} is rejected since, from the table above, level of educational qualification is not significant as the P>0.05. The P value for educational qualification is 0.167. This means that in the Eastern Cape Province education level of the SMME owner (or manager) does not influence the adoption of e-business.

7.2 Analysis of the Impact of Independent Variables on E-Business Adoption

The following incentives are discarded from the impact analysis as they are insignificant, that is, their P values are greater than 0.05: which leads to an increase in customer loyalty; leads to an increase in information exchange; attracts new investors and improves international market access. Consequently, the following insignificant impediments (drawbacks) are also left out: firm age; age of owner; gender; level of IT investment and uncertainty about e-business returns.

The 16 significant variables from the above table can now be used to come up with the following logistic regression model:

$$Y=a+b_1CA+b_2CO+b_3RD+b_4PG+b_5NM+b_6TR+b_7GV+b_8KN+b_9SC+b_{10}NF+b_{11}RS+b_{12}XT+b_{13}BT+b_{14}NC+b_{15}RE+b_{16}VS$$

In the model Y represents the adoption, a represents a constant while b_1, b_2, b_3 up to b_{16} are regression coefficients. The regression coefficients determine the extent of the impact of the independent variables on Y. An independent variable with a regression coefficient of 0 has no impact on the adoption. Consequently, the more the regression coefficient exceeds 0 the greater the impact of the independent variable. A positive coefficient increases the probability of adoption while a negative coefficient decreases the probability of adoption. To determine the influence of the independent variables on the adoption a comparison of the regression coefficients is made in Table 2.

Insert Table 2 about here

The following independent variables with negative coefficients are associated with decreased probability of adopting e-business: prestige, complexity of e-business, little incentives and business type. These are ranked

with negative values in the table. Business type has the greatest decreasing impact, followed by little incentives, e-business complexity and then prestige. The other independent variables which increase the probability of adoption are ranked with positive values in Table 2, above, in terms of their influence on adoption. The most important variables according to the rankings are: niche market service, training, government support, security, vision, business type and perceived little incentives. Prestige is the only new finding. All the other variables had been confirmed in studies done elsewhere for example; Chau and Tam (1997) highlighted all these variables as significant in their exploratory study in California. This, therefore, means that firm owners and policy holders must target these important variables in the case of policy interventions.

8. Conclusions

The findings of the study are particularly important to SMME owners. Most importantly, the study provides a better understanding to the enterprise owners of the significant factors which influence the adoption of information and communication technologies. The study highlights the benefits and barriers to the adoption process. Hence, the research helps SMME owners to gain a better understanding of the benefits and to manage and mitigate the effects of barriers when adopting e-commerce. The study puts forward the case of adopting e-business by highlighting the enormous benefits obtained from adopting e-commerce. Non-adoption is discouraged even in the face of some barriers. The research encourages SMME owners to be innovative. In the study, SMME owners with a positive attitude towards e-commerce also perceived e-commerce to be useful and easy to use. Those with negative attitude are laggards who are dismissive and afraid to let go of their traditional means. Therefore, the research promotes SMME owners to have a positive attitude to assist them in adopting e-business.

The study has far reaching effects on encouraging SMME owners to develop sustainable business models to efficiently and effectively drive their business processes. E-business helps businesses to be more competitive, cost effective, relevant and accessible. Therefore, e-business is a business model which represents a new and innovative way of doing business. The business operating environments are changing and SMMEs should be responsive to remain in business. Likewise, policy makers should be flexible in light of changing times.

The study also has strong implications on policy formulation by the policy maker. In South Africa the government and quasi-government institutions come up with policies and strategies to improve the adoption of e-commerce in order to improve the SMMEs' economic contribution. Critical variables highlighted in the study help policy makers to come up with relevant and effective policies to improve the adoption of e-commerce by small enterprises. By knowing the critical variables the policy makers are able to use their resources efficiently to target problematic areas and address the sluggish adoption of e-business by SMMEs. Hence, the study gives an opportunity to policy makers to come up with policies to speed the adoption.

9. Limitations

The study only focused on bed and breakfast SMMEs in the Buffalo City area in South Africa. SMMEs in the other sectors of the economy and those tourism SMMEs which are outside the targeted geographical area were left out due to time and financial constraints. The research was limited to bed and breakfast SMMEs registered with Small Enterprise Development Agency (SEDA).

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Table 1. Significance of Independent Variables

	Codes	R^2	P	Status
INCENTIVES				
Improved customer care	CA	4.60	0.032	Sig
Gives competitive edge	CO	9.06	0.003	Sig
Leads to cost reduction	RD	3.97	0.046	Sig
Gives prestige in the industry	PG	4.41	0.036	Sig
Leads to increase in customer loyalty		3.21	0.059	Ns
Leads to increase in information exchange		3.79	0.051	Ns
Allows service of niche markets	NM	5.77	0.016	Sig
Attracts new investors		0.51	0.477	Ns
Improves international market access		0.55	0.460	Ns
IMPEDIMENTS				
Lack of training	TR	36.75	0.000	Sig
Lack of government support	GV	7.10	0.006	Sig
Lack of IT knowledge among staff	KN	6.15	0.013	Sig
Security	SC	24.35	0.000	Sig
High initial costs of acquiring e-business infrastructure	NF	6.01	0.014	Sig
Firm too small to adopt		0.74	0.831	Ns
Low penalties against hackers		3.74	0.062	Ns
Insufficient internal resources	RS	9.85	0.002	Sig
Complexity of e-business	XT	12.86	0.000	Sig
Uncertainty about e-business returns		0.82	0.366	Ns
Type of business does not require e-business	BT	36.01	0.000	Sig
Perceiving incentives from e-business as little	NC	19.23	0.000	Sig
Staff resistance	RE	4.62	0.032	Sig
Level of IT investment		0.55	0.460	Ns
Gender		0.00	0.167	Ns
Age of the owner / manager		2.20	0.699	Ns
Firm vision	VS	21.09	0.000	Sig
Firm age		0.74	0.981	Ns
EDUCATION				
Level of qualification		3.95	0.167	Ns

NOTE: Sig means significant, Ns means insignificant.

Table 2. Impact of Independent Variables on E-Business Adoption

Variable	Regression coefficient	0dds ratio	Z statistic	Ranking
CA	1.595	4.93	1.996	8
CO	2.120	8.33	2.680	7
RD	1.498	4.47	1.869	10
PG	-1.073	0.342	-2.065	-4
NM	13.892	1079381.4	1.844	1
TR	3.584	36.00	5.217	3
GV	4.539	52.583	6.045	2
KN	1.587	4.889	2.335	9
SC	2.811	16.625	4.405	5
NF	1.243	3.467	2.400	12
RS	2.689	14.710	2.534	6
XT	-1.899	0.150	-3.405	-3
BT	-3.696	0.025	-4.970	-1
NC	-3.486	0.031	-3.201	-2
RE	1.595	4.929	1.996	8
VS	3.018	20.444	3.801	4