

Barriers to Internet Adoption: A Descriptive Study of Small and Micro Enterprises in the Business-Services Sector

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Abstract

SMEs are important in any economy, because they are the key drivers of innovation, employment and economic growth. Harnessing the Internet for business purposes improves SMEs' operational efficiencies and competitiveness in a global economy. While there are many studies, which provide insights about factors influencing Internet adoption among SMEs, there is little data about Internet adoption in African countries. Therefore this study highlights a relatively unexplored research context, namely SMEs in the business-services sector in an emerging economy. The objectives of the study were to describe Internet usage by SMEs and explore the factors that inhibited Internet adoption. A quantitative approach using self-administered questionnaires was used to conduct the study. The results showed that while SMEs are aware of the advantages provided by the Internet; the short-term benefits were not apparent enough to SME owners for them to plan to make any significant investment in adopting Internet technologies. Although most SMEs acknowledged that the Internet is relevant to their businesses, they identified the main barriers to Internet adoption as concerns about the costs and complexity, issues around security and lack of support, when it comes to using the Internet. The recommendations of the study are that, the government should give businesses more incentives to adopt and utilise the Internet and, SME owners/managers need to realise that as businesses

increasingly engage in e-commerce, their SMEs will have more opportunities to compete in the global marketplace.

Keywords: Small businesses, SMEs, Internet adoption, e-commerce, developing countries, business-services sector

Introduction

Globally, small and micro enterprises (SMEs) play an important role in helping to diversify a country's economic base by providing it with opportunities to respond to varying market conditions (Beaver 2007). The adoption of Internet technologies by SMEs is vital for their on-going survival in an increasingly competitive marketplace (Porter 2001). The reason for this is the Internet offers direct links with trading partners (customers, suppliers, distributors and creditors) by facilitating information transfer, irrespective of physical boundaries.

Studies conducted in the United-States (Xu, Zhu & Gibbs 2004), Turkey (Kula & Tatoglu 2003), China (Riquelme 2002), Netherlands (Walczuch, van Braven & Lundgren 2000) and Tasmania (Jones, Hecker & Holland 2002) illustrate that the main benefits of Internet access and adoption strategies to improve small business competitiveness, are an increase in the business's customer reach and improved market research. However Singh, Garg and Deshmukh (2010) identified that some of the factors constraining the competitiveness of SMEs are inadequate access to technologies, ineffective selling techniques, and limited market research.

Problem Statement

Cavaye and van Akkeren (1999) developed a model, based on the prevailing literature of that time, which described the factors influencing Internet adoption for e-commerce. The results of their study showed that the inhibitors of Internet adoption were: lack of internal IT expertise, lack of knowledge about the Internet, and the expenses associated with setting up Internet access. Ten years later, Tan, Chong, Lin and Eze (2010) showed that the main barriers to Internet adoption included the lack of networking infrastructure, and the high costs of ICT hardware and software.

In South Africa, small businesses are slow to use Internet technologies for commerce purposes (Moodley 2003; Cloete 2002). This suggests that there are barriers to Internet adoption. Non-adoption of the Internet may impact negatively on the small business' competitiveness in the marketplace. In an ever-widening global economy, the result of Internet non-adoption can be potentially fatal to a small business. However while there are many studies that provide insights about factors inhibiting Internet adoption, there is little data about Internet adoption among SMEs in African countries (Molla & Licker 2004; Boateng, Molla & Heeks 2009).

Aim and Objectives

The aim of this article is to contribute to the theoretical understanding of Internet adoption among South African SMEs, by exploring Internet usage and examining the factors that inhibit Internet adoption for commerce purposes. The research is delimited to SMEs in the business-services sector in South Africa because this sector is most likely to be using the Internet for business purposes but is under-researched (Tan *et al.* 2010; Boateng *et al.* 2009). Thus this article's research objectives are:

1. To describe Internet usage among SMEs in the business-services sector; and
2. To determine the factors that inhibit Internet adoption among SMEs in the business-services sector

Information generated from this research should provide empirical insights into Internet usage and adoption among SMEs, with a view to making recommendations to government and policy makers to facilitate Internet adoption. In addition, it provides information about the business needs of SMEs and their current uses of the Internet, which is useful for Internet service providers, information technology (IT) consultants and business development consultants. Finally, the study provides information for SME owners about why the Internet is important for their businesses and how to exploit the technology to remain competitive.

This article has four parts. First it reviews the extant literature regarding SMEs and Internet adoption. Next the research methodology and

data analysis techniques are presented. Then the findings are discussed. Finally, implications and directions for further research are offered.

Literature Review

Small and Micro Enterprises Defined

The description of small and micro enterprises (SMEs) differs in the literature and no standard definition exists (Al-hawari, Al-Yamani & Izwawa 2008; Cloete 2002; Martin & Matlay 2001). In South Africa, the National Small Business Act of 1996 defines a small business ‘as a separate and distinct business entity, including cooperative enterprises and non-governmental organisations, managed by one owner or more which, including its branches or subsidiaries, if any, is predominantly carried on in any sector, or sub-sector of the economy’ (SA Government 1996:2). Furthermore, the Act stipulates that business size should be classified according to industrial sector, followed by specified criteria for the number of full-time employees, annual turnover and total gross asset value.

The Business-Services Sector

The Standard Industry Classification (SIC) system is an internationally accepted set of codes for the standard classification of all economic activities. These codes were designed to classify businesses according to different types of economic activities. According to the SIC system, the business-services sector, comprises of the activities outlined in Table 1 below (CIPRO 2008).

Dos Santos and Bacchialoni (2009) reported that total information and communication technology (ICT) spend for the South African financial and other business-services sector is forecasted to reach approximately R55 billion by 2013. Of this, R26 billion will be spent on telecommunications (e.g. telephone, fax, Internet) indicating that this sector is an intensive user of ICT. This means that the sector heavily invests in ICT in South Africa. The implication for the current study is that the business-services sector is an ideal sector in which to investigate Internet adoption because it is likely to be using the Internet for business purposes.

Table 1: Activities in the business-services sector

Accounting/ Tax/ Auditing services	Legal services
Advertising	Labour brokers
Architectural and/or Engineering services	Packaging activities
Business and/or Management consultancy	Photography and/or Sign-writing
Building and/or industrial plant cleaning services	Renting of machinery and equipment
Computer related services	Research and development activities
Debt collection and/or credit rating services	

Adapted from "Standard Industry Classifications for the Business-services Sector", (CIPRO, 2008)

The Importance of SMEs in the South African Business-Services Sector

In the preliminary results of the September 2009 Quarterly Financial Services Survey report, South African small and micro enterprises (SMEs) across all industries, recorded a total income of approximately R294 million. Furthermore, the same report recorded that SMEs in the real estate and business-services industry recorded an income representing 15% of the total income of all SMEs in South Africa and approximately 31% of this, was income recorded for the business-services sector (StatsSA 2009). Hence it is evident that SMEs in the business-services sector make a substantial contribution to the South African economy in terms of gross domestic product and employment.

Internet Adoption within an SME Context

The Internet is a vast computer network that links smaller computer networks worldwide. The Internet includes commercial, educational, governmental, and other networks, all of which use the same set of communications protocols to connect to one another. Thus, this global information system serves as a mechanism for information dissemination, and a medium for collaboration and interaction, between individuals and their computers without regard for geographic location. The Internet is becoming recognised

increasingly for the vast array of information services it offers (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts & Wolff 2009).

Boateng *et al.* (2009:3) defined e-commerce as the 'sharing of business information, maintaining of business relationships, and conducting of business transactions, by means of telecommunications networks'. According to this definition e-commerce is not restricted to the actual buying or selling of products and services using technology, but also includes the pre-sale and post-sale activities across the supply chain (Bocij, Chaffey, Greasley & Hickie 2003). In order to survive in an era of electronically mediated information exchanges, and successfully practice e-commerce, businesses need to adopt the Internet (primarily, e-mail and web technologies) (Al-hawari *et al.* 2008).

Since the Internet offers direct links with customers, suppliers, distributors and creditors by facilitating information transfer irrespective of physical boundaries, it offers small businesses the opportunity to increase their customer base without having to physically contact customers or advertise in other parts of the world (Kula & Tatoglu 2003; Drucker 1999). Porter (2001) commends this increase in customer reach as it is directly linked to improved competitiveness. He highlights that the Internet and e-commerce are enabling conditions that allow businesses to operate efficiently. This operational efficiency is the cornerstone of competitive sustainability. He also posits that businesses have no choice but to adopt Internet and e-commerce technologies if they want to stay competitive.

However, SMEs, not using the Internet, are reluctant to change their current business models (Beckinsale & Levy 2004). This may be, because SMEs face greater risks in adopting the Internet than larger businesses due to inadequate resources and limited knowledge. Severe constraints on financial and human resources can also cause SMEs to lag behind large businesses when it comes to using the Internet (MacGregor & Vrazalic 2005; Chau & Kuan 2001).

Currently, the geographical distribution of connections to the Internet heavily favours the highly industrialised countries and there is unequal access to network-based services between the developing and developed world thus emphasising, the digital divide (Aladwani 2008; Lal & Oyelaran-Oyeyinka 2005; Moodley 2003; Travica 2002). In addition, in developing countries, the geographical distribution of the Internet is often

limited to urban centres, the costs of technology adoption are higher than average annual income and Internet adoption remains in the initial stages. The trend in developing countries is Internet adoption through cell-phone usage because cell-phones are relatively cheap compared to personal computers (Howard & Mazaheri 2009; Moodley 2003).

Many developing nations have low computer penetration rates and lack the telecommunications infrastructure necessary to take full advantage of the Internet. They also lack the availability of an economically priced telephone service and regular electricity supply. Internet access in these countries is expensive and unreliable. Furthermore, access to Internet-based markets (through e-commerce) depends on the availability of skilled labour and this is often lacking in developing nations (Lal & Oyelaran-Oyeyinka 2005; Moodley 2003). Moodley (2003) questions whether the Internet will marginalise third world businesses or whether it will facilitate their access to world markets.

Several studies show that SMEs are not convinced of the financial benefits that could result from using the Internet. SMEs reported that the start-up investment costs for Internet adoption were too high, and that the return on investment was questionable. Furthermore, the SMEs owners did not believe that Internet adoption could result in lower operational costs (Tan *et al.* 2010; MacGregor & Vrazalic 2005; Walczuch, van Braven & Lundgren 2000; Cavaye & van Akkeren 1999).

There is insufficient education and knowledge about the Internet and its uses, among SME owners and staff. Many studies show that SMEs lack the time and opportunity to learn how to use the Internet. Consequently, they find it too complex to use and/or unsuitable for business operations. While some SMEs are knowledgeable about the Internet, there is often a lack of expertise and competence when it comes to actually using the Internet (Johnson 2010; Tan *et al.* 2010; MacGregor & Vrazalic 2005; Dholakia & Kshetri 2004; Ferrer, Schroder & Ortman 2003; Stansfield & Grant 2003; Hornby, Goulding & Poon 2002; Riquelme 2002; Cavaye & van Akkeren 1999).

However, trying to find qualified staff to fill the gap left by lack of expertise is difficult. SMEs have limited financial resources to recruit and retain appropriately skilled IT staff. Moreover, career development and advancement for IT staff is limited in SMEs and they tend to choose working

for larger businesses (Tan *et al.* 2010; MacGregor & Vrazalic 2005; Stansfield & Grant 2003; Hornby *et al.* 2002; Chau & Kuan 2001; Cavaye and van Akkeren 1999).

This lack of financial resources has further implications, in that SMEs cannot afford the infrastructure (e.g. computers, modems, networks, software and Internet service provider subscriptions) required to adopt the Internet. Thus, the high costs of technology and associated infrastructure means that the Internet is not widely used in SMEs as evidenced in studies conducted by Tan *et al.* (2010) and Alam (2009). Furthermore, the rapid changes in technological developments are yet another prohibitive factor affecting Internet adoption among SMEs (Dholakia & Kshetri 2004; Stansfield & Grant 2003; Hornby *et al.* 2002; Riquelme 2002; Walczuch *et al.* 2000; Cavaye & van Akkeren 1999; Poon & Swatman 1999; Tan & Teo 1998).

Linked to technological developments is geographical location. The literature shows that SMEs located in rural and remote areas are less likely to adopt the Internet because of the lack of telecommunication networks and Internet connectivity infrastructure. While there may be low cost methods of access in urban areas (cities and metropolitan areas), the same cannot be said for rural and remote areas. Moreover, the further away a business is from the resources it needs; the longer it takes and the more it costs the business, to get those resources (Donner 2006; de Klerk & Kroon 2005; MacGregor & Vrazalic 2005; Burgess 2002).

Many studies highlighted that fears and concerns about the security of information on the Internet were barriers to Internet adoption. SMEs were concerned about unauthorised access to sensitive or proprietary information, and limited verification of authorship of messages received (Tan *et al.* 2010; Lee & McGuiggan 2009; MacGregor & Vrazalic 2005; Dholakia & Kshetri 2004; Stansfield & Grant 2003; Walczuch *et al.* 2000; Cavaye & van Akkeren 1999; Tan & Teo 1998).

In their studies, Johnson (2010), Tan *et al.* (2010), Dholakia and Kshetri (2004), Hornby *et al.* (2002) and Poon and Swatman (1999) draw attention to the lack of management support and encouragement for Internet adoption as an important barrier. If the decision to adopt the Internet is not driven by the SME owner or manager it is unlikely that the SME will adopt the Internet. This lack of management support may be linked to management

and staff reticence to use new technologies and a preference for conventional methods such as telephone and fax as an information and telecommunication medium. There is often a resistance to change (Johnson 2010; MacGregor & Vrazalic 2005; Cavaye & van Akkeren 1999).

Also linked to lack of management support is the belief by SME owners that Internet adoption will result in decreased productivity among staff. Some SME owners believe that their staff will use the Internet frivolously and for unintended purposes. It is often these managers' perception that staff will waste too much time surfing the net, as opposed to performing their designated job functions (Tan *et al.* 2010; Walczuch *et al.* 2000; Tan & Teo 1998).

Some studies show that low use of the Internet by customers and suppliers was a barrier to adoption for SMEs. Due to the lack of critical mass of stakeholder usage (customers and suppliers) SMEs reported that the Internet was not relevant to their businesses (Tan *et al.* 2010; MacGregor & Vrazalic 2005; Stansfield & Grant 2003).

Howard and Mazaheri (2009) report that English language literacy is considered by some researchers as a potential predictor of Internet adoption, because surfing the Internet, may require proficiency in English. However, empirical evidence has not been conclusive in this regard (Alam 2009; Al-hawari *et al.* 2008).

Research Methods

Study Population

In this study, a small business was defined as having a minimum of 6 to a maximum of 50 employees (excluding the owner); and a micro enterprise as having a minimum of 1 to a maximum of 5 employees (excluding the owner) (SA Government 1996).

The supply chain department at the Durban City Engineers office had a record of approximately 34,000 businesses in the Durban region. These were registered, in terms of the Companies Act, as formal businesses. Of these, approximately 21, 000 were SMEs. A search for SMEs in Chatsworth, based on street code 4092 (SAPO 2010), produced a list of 317 SMEs. From the 317 SMEs a search for businesses whose core activities were categorised

as business-services (SIC) was conducted. This amounted to a 112 SMEs in the business services-sector.

The Sample

In this research study, purposive, judgement sampling was conducted. The applicable criteria were:

- Only owners or managers of SMEs which were
- Operating in the business-services sector AND
- Physically located in Chatsworth AND
- Had 1 or more, but less than 50 employees

The reason for choosing owners and managers is because it is well documented that the perceptions of the owner/manager are a key factor that influences Internet adoption among SMEs (Alam 2009; Dholakia & Kshetri 2004; Kula & Tatoglu 2003; Stansfield & Grant 2003; Cragg, Mehrrens & Mills 2001; Walczuch *et al.* 2000; Cavaye & van Akkeren 1999; Poon & Swatman 1999; Iacovou, Benbasat & Dexter 1995). The sample size was calculated to be 80 participants (from an estimated population of 112) with a confidence interval of 95% and a 5% margin of error.

Ethics

Ethical approval was obtained from the University of KwaZulu-Natal Management Studies' Research Ethics Committee. The participants were informed of the details of the study and their rights as participants. They were asked to sign informed consent documents.

The Questionnaire

The questionnaire that was used had been developed and used in a similar study conducted in Scotland (Stansfield & Grant 2003) and was adapted for use in the current study. The aim of the research instrument was to reveal the factors influencing Internet adoption and its usage in SMEs.

The first part of the questionnaire consisted of 5 questions pertaining to the demographic representation of the SME in terms of its size, age, service offerings and types of ICTs currently being used. The second part comprised of 19 questions about the factors influencing the use of the Internet and was designed to measure the owner/manager's perceptions using a five-point Likert scale where 1 = strongly, 2 = disagree, 3 = no opinion, 4 = agree and 5 = strongly agree. The third part of the questionnaire was made up of 21 questions about applications of the Internet being used, within the SME.

The respondents were asked to indicate their present practices and future plans regarding Internet usage. The measurement scale was 1 = yes, 2 = no and 3 = plan to.

Pilot Study

The questionnaire was piloted among 5 SMEs located in Durban's south basin (specifically the Jacobs area with street code 4031, SAPO 2010). The respondents were asked to provide feedback about the layout of the questionnaire, how long it took them to complete the questionnaire, and their understanding of the questions and response categories. The results were reviewed and the questionnaire adjusted accordingly. Subsequently, structured self-administered questionnaires were printed and used to collect primary data from business owners or managers who managed SMEs in the business-services sector, located in Chatsworth.

Data Collection

The researcher physically visited the participant's place of business. This was done to ensure increased response rates and completeness of the questionnaire. The cost of travelling to the place of business was reduced, since the SMEs were located in an area that was easily accessible to the researcher. The location of the SMEs made it easier for the researcher to follow up with those who did not complete the questionnaire on at least two occasions, to ensure a reasonable response rate.

Leedy and Ormond (2005) maintain that data collected with questionnaires often reflect the reading and writing skills of the respondents, and that they (the respondents) sometimes tell the researcher what they think the researcher wants to hear. With regard to the former, efforts were made by the researcher to address any queries had by the respondents, before and after a respondent answered the questionnaire. Regarding the latter issue, the researcher left the respondent alone and in-private to fill out the questionnaire, so as to minimise any influence over the responses. In total, 61 of the 80 SMEs agreed to participate in the study; thus the response rate was 76.25%.

Data Analysis

The data collected was coded and analysed using the statistical software package SPSS (SPSS 2006a). The analysis focused on the frequency analysis, measures of central tendency, and correlations of the profile of the respondents. The data collected was predominantly ordinal, and Leedy and Ormond (2005) state that calculating the means and standard deviations for ordinal data are inappropriate. Therefore, a decision to test for the medians and modes of variables was taken and the sum of the responses was used to rank the data.

Non-parametric tests are more suited for ordinal data (Leedy & Ormond, 2005). However, Field (2009) cautions against simply conducting non-parametric tests on ordinal data and recommends that a Kolmogorov-Smirnov (K-S) test be conducted to determine whether data fall within a normal distribution. Hence, a K-S test was conducted to check whether the scores were normally distributed and the results were significant. This implied that the data did not follow a normal distribution. Therefore, a decision to conduct non-parametric tests was taken.

Internal Consistency Reliability: Cronbach's alpha

Reliability of the research instrument refers to the extent to which the measurement scales are free from random error and yield consistent results. If the association between different scales (data) is high, this implies that

they are consistent at giving the same results at different times and, therefore, the measurement scales are considered reliable (Leedy & Ormond 2005; Gliem & Gliem 2003).

Cronbach's Alpha (α) co-efficient was used to determine the internal reliability and consistency of the constructs in Table 2. Cronbach's alpha coefficient ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1 the greater the internal consistency and reliability of the items in the measurement scales of the research instrument (Gliem & Gliem 2003). A value greater than 0.7 was considered reliable, which according to Field (2009) is the norm. Table 2 shows the constructs which were identified and their corresponding Cronbach's alpha.

Table 2: Cronbach's Alpha (α) co-efficient

Construct	Cronbach's α
Objective1: <u>Uses of the Internet</u>	
– E-mail	0.740
– E-commerce	0.800
– Web-browsing	0.725
Objective 2: Inhibiting factors	0.701

The constructs used in this study were found to have adequate internal reliability, since the constructs of Internet usage (specifically: e-mail, e-commerce and web-browsing), and inhibiting factors, had Cronbach's alpha values greater than 0.7.

Results

Overall Sample Characteristics

The work in this study was based on a quantitative approach using self-administered questionnaires. The views of SME owners and managers were sought and primary data was obtained. Table 3 summarises the demographic characteristics of the sample in this study.

Table 3: Demographic representation of the SMEs

Characteristic	No.	%	Characteristic	No.	%
Size of the business			Age of the business		
Micro	38	62.3	Less than 1 year	2	3.3
Small	23	37.7	1 – 3 years	13	21.3
			Greater than 3 years	46	75.4
Breakdown of activities in the business-services sector			Information technologies being used in the business (yes responses)		
Legal	15	24.6	Computers	57	93.4
Information and communication technology	10	16.4	Telephone or Fax (TeleFax)	54	88.5
Accounting, auditing and tax	7	11.5	E-mail	53	86.9
Business management	7	11.5	Cell-phones	50	82.0
Building, cleaning and fumigation	6	9.8	Internet	48	78.7
Equipment rental	5	8.2	Websites	13	21.3
Photography and sign-writing	4	6.6	Intranet	5	8.2
Architecture and engineering	2	3.3	Other: (<i>Radios and wireless local area network (LAN)</i>)	2	3.3
Debt collection and credit rating	2	3.3			
Packaging	2	3.3			
Advertising	1	1.6			

Objective 1: Internet Usage

Table 4 describes Internet usage among SMEs. The variables were recoded as ordinal scales (in ascending order where: 1 = no, 2 = plans to, 3 = yes) which reflected an increasing likelihood of Internet adoption. Various uses of the Internet that were identified in the literature review were tested in this study. The shaded area in the table highlights those variables which are applicable in the current research context [i.e. the respondents said that they were using the Internet for these purposes (median=3, S>122)]. The unshaded area shows those factors which were tested but found to be not applicable (median=1, S<122).

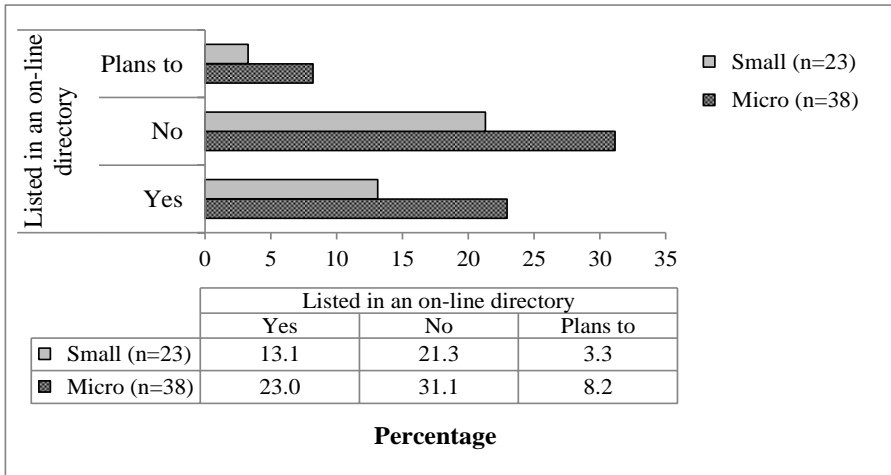
Table 4: Current and planned uses of the Internet

Variable	No (%)	Plans to (%)	Yes (%)	Median	Mode	Sum (S)
Uses Internet to find suppliers	4.92	8.20	86.89	3	3	172
Uses Internet to find out about competitors	8.20	3.28	88.52	3	3	171
Uses Internet to do industry/market research	8.20	6.56	85.25	3	3	169
Does Internet banking	16.39	1.64	81.97	3	3	162
Uses Internet to attract new customers	14.75	16.39	68.85	3	3	155
Uses Internet because its expected in the industry	27.87	6.56	65.57	3	3	145
Uses Internet to build business connections	24.59	21.31	54.10	3	3	140
Uses Internet to receive payments for services rendered	34.43	11.48	54.10	3	3	134
Allows staff to use the Internet to search for information	49.18	3.28	47.54	2	1	121
Provides info about its services over the Internet	42.62	19.67	37.70	2	1	119
Uses Internet to order non-inventory items	59.02	4.92	36.07	1	1	108
Use the Internet to streamline its internal operations	57.38	26.23	16.39	1	1	97
Uses Internet to recruit new staff	70.49	4.92	24.59	1	1	94
Purchases goods/services over the Internet	73.77	1.64	24.59	1	1	92
Sells goods/services over the Internet	78.69	8.20	13.11	1	1	82

Notes: n=61. The mode is the most frequently occurring response, the median is the mid-point after the responses have been arranged from smallest to highest and the sum refers to the total sum of responses of the ordinal scale where (1=No, 2=Plan to, 3=Yes). S<122 indicates “non-use”, S=122 indicates “plans to use” and S>122 indicates “current use”.

In order for SMEs to increase their market reach, they need to sell and market themselves over the Internet; they need to have a website or at the very least they need to be listed in on-line directories. Figure 1 shows the number of SMEs that are listed in on-line directories and, if they are not, whether they intend to get listed in on-line directories.

Figure 1: Number of SMEs listed in on-line directories



Websites are an important tool for e-commerce and Figure 2 shows the number of SMEs that currently have a website, and, if they don't, whether they plan to get one in the future.

Figure 2: Frequency of website ownership

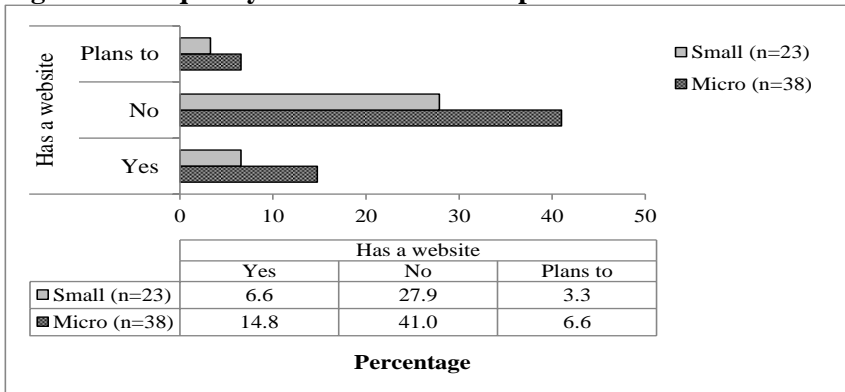
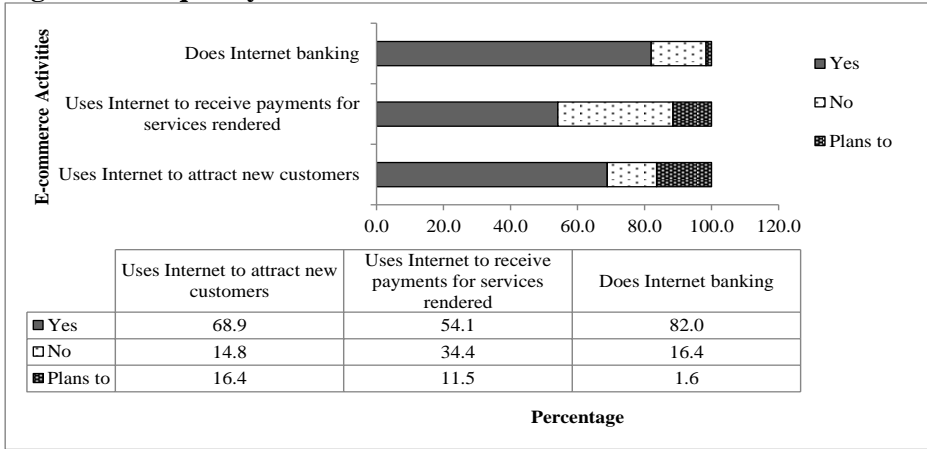


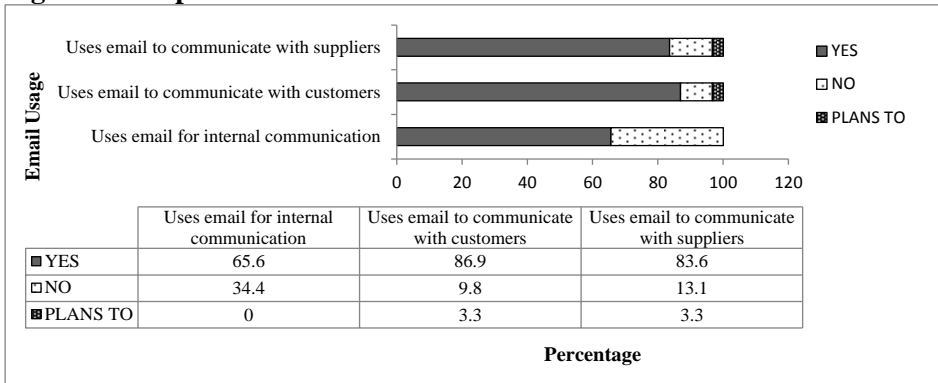
Figure 3 summarises the e-commerce activities in which the respondents engaged.

Figure 3: Frequency of e-commerce activities



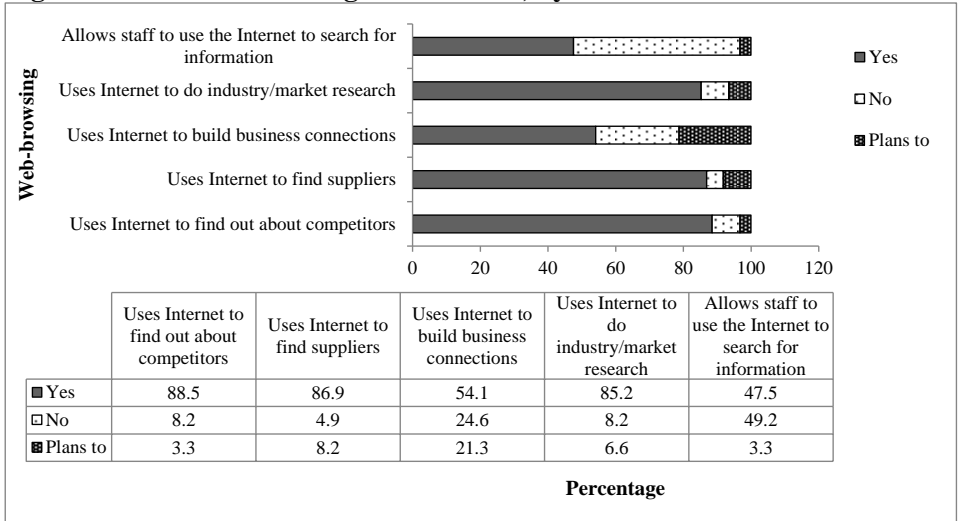
In relation to e-mail, the respondents were asked if they utilise e-mail applications in their businesses; 86.9% (53) of SMEs responded in the affirmative. The construct of e-mail as a communication medium looked at the purpose for which e-mail is being used and the results are presented in Figure 4.

Figure 4: Purpose for which e-mail is used



The web-browsing construct looked at how the SMEs were using the Internet to search for information. The results are presented in Figure 5.

Figure 5: Information being searched for, by SMEs



Objective 2: Factors Inhibiting Internet Adoption

In the second part of the questionnaire, respondents were asked to rate their agreement with statements regarding inhibiting factors sourced from the literature. In the questionnaire a five-point Likert scale was used where: 1 = strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree. In order to maintain uni-directionality of the variables for analysis, the variables reflecting the inhibiting factors were reverse recoded in SPSS to 1 = strongly agree, 2 = agree, 3 = no opinion, 4 = disagree, 5 = strongly disagree, and the variables were set as ordinal scales. The sum of the responses was then used to rank the inhibiting factors in ascending order.

Various barriers to Internet adoption, as identified in the literature review were tested in this study (Table). The shaded area in the table highlights those variables which are applicable in the current research context (i.e. the respondents agreed that these were inhibiting factors

(median=2, S<183). The un-shaded area shows those factors that were tested but found to be not applicable (median=4, S> 183).

Table 5: Descriptive statistics of factors inhibiting Internet adoption

Variable	Strongly agree (%)	Agree (%)	No opinion (%)	Disagree (%)	Strongly disagree (%)	<u>CENTRAL TENDENCY</u>		
						Median	Mode	Sum (S)
Cost of electricity is too high	44.26	50.82	3.28	0.00	1.64	2	2	100
There is a lack of support from the government for businesses to use the Internet	16.39	75.41	4.92	1.64	1.64	2	2	120
IT consultant services are too expensive	13.11	49.18	1.64	34.43	1.64	2	2	160
The Internet is too expensive	13.11	49.18	1.64	32.79	3.28	2	2	161
The Internet poses a security threat to businesses	4.92	50.82	8.20	32.79	3.28	2	2	170
There is a lack of information on how to use the Internet for business purposes	6.56	44.26	3.28	42.62	3.28	2	2	178
Cost of equipment required to use the Internet is too high	1.64	52.46	1.64	40.98	3.28	2	2	178
My staff will waste time using the Internet	8.20	34.43	3.28	54.10	0.00	4	4	185
The Internet is too slow	3.28	24.59	9.84	55.74	6.56	4	4	206
IT consultants are hard to find	3.28	18.03	1.64	68.85	8.20	4	4	220
The Internet is too complex	0.00	16.39	4.92	73.77	4.92	4	4	224
The Internet has no relevance to this business	0.00	9.84	6.56	63.93	19.67	4	4	240
I do not understand how the Internet works	0.00	4.92	1.64	77.05	16.39	4	4	247

Notes: n=61. The mode is the most frequently occurring response and the median is the mid-point after the responses have been arranged from smallest to highest. The sum refers to the total sum of responses of the ordinal scale where (1=strongly agree, 2=agree, 3=no opinion, 4=disagree, 5=strongly disagree). S<183 indicates agreement, S=183 indicates no opinion and S>183 indicates disagreement

In order to further explain the inhibiting factors, only those SMEs who did not adopt the Internet (non-adopters) were selected for further analysis. We determined that 21% (13 SMEs) were non-adopters and a frequency analysis on the inhibiting factors identified in Table 5 was conducted on this group. The shaded area in Table 6 shows the barriers to Internet adoption, from the point of view of the non-adopters. The un-shaded area illustrates that these factors were not prevalent among non-adopters ($S > 39$, median ≥ 3).

Table 6: Non-adopters’ reasons for not using the Internet

Inhibiting factors	Strongly agree (%)	Agree (%)	No opinion (%)	Disagree (%)	Strongly disagree (%)	Median	Mode	Sum (S)
Cost of electricity is too high	30.77	53.85	7.69	0.00	7.69	2	2	26
The Internet is too expensive	15.38	46.15	0.00	38.46	0.00	2	2	34
IT consultant services are too expensive	0.00	61.54	7.69	30.77	0.00	2	2	35
Cost of equipment required to use the Internet is too high	7.69	46.15	7.69	38.46	0.00	2	2	36
There is a lack of information on how to use the Internet for business purposes	0.00	46.15	15.38	38.46	0.00	3	2	38
The Internet poses a security threat to businesses	7.69	38.46	7.69	38.46	7.69	3	2	39
There is a lack of support from the government for businesses to use the Internet	0.00	7.69	92.31	0.00	0.00	4	3	51

Notes: n=13. The mode is the most frequently occurring response and the median is the mid-point after the responses have been arranged from smallest to highest. The sum refers to the total sum of responses of the ordinal scale where (1=strongly agree, 2=agree, 3=no opinion, 4=disagree, 5=strongly disagree). S<39 indicates agreement, S=39 indicates no opinion and S>39 indicates disagreement

Correlation Analysis: Spearman's Correlation Co-Efficient

Spearman's correlation co-efficient (also known as Spearman's rho - r_s) was used to determine correlations between Internet adoption inhibitors, as a group, and using the Internet for business purposes. When using categorical variables that are directional (ordinal) it is more appropriate to report the results of the one-tailed tests instead of the two-tailed tests (Field 2009).

Factors Inhibiting Internet Adoption

- The Internet being too expensive was significantly correlated with the cost of equipment required to use the Internet, $r_s=.306$, $p(\text{one tailed})<0.01$ and lack of information on how to use the Internet for business purposes, $r_s=.328$, $p(\text{one-tailed})<0.01$.
- Internet complexity, was significantly correlated with a lack of understanding about how the Internet works, $r_s=.339$, $p(\text{one tailed})<0.01$ and lack of information on how to use the Internet for business purposes, $r_s=.295$, $p(\text{one-tailed})<0.05$.
- The Internet posing a security threat to businesses was significantly correlated with a lack of understanding about how the Internet works, $r_s=.272$, $p(\text{one tailed})<0.05$.
- Lack of government support was significantly correlated with lack of information on how to use the Internet for business purposes, $r_s=.290$, $p(\text{one-tailed})<0.05$.
- Internet adoption was significantly related to the complexity of the Internet $r_s=.258$, $p(\text{one-tailed})<0.05$.

Discussion

Technologies Being Used by SMEs in the Business-Services Sector

Overall, 79% of the respondents indicated that their organisation currently used the Internet, and e-mail usage was slightly higher at 87%. While most of the SMEs use computers (93%); website ownership (21.3%) and Intranet usage (8.2%) were much lower (Table 3). This is consistent with findings of the study conducted by Stansfield and Grant (2003) who also found that,

while some technologies are being used extensively, other technologies like Intranets and having websites were limited among Scottish SMEs.

In terms of communication capabilities, SMEs were equipped with telefaxes (89%) and cell-phones (82%). The high percentage of cell-phone technology indicates that it plays a vital role in business communication. It also implies that mobile commerce (m-commerce) is likely to be embraced in the future. Besides telefax and cell-phone services, SMEs were using e-mail (87%) to facilitate communications with business partners and employees.

Objective 1: Uses of the Internet

Table 4 showed that SMEs currently use the Internet as an information search tool to find out about competitors, customers and suppliers, and to conduct market related research. Furthermore analysis of their usage patterns revealed that they most often used the Internet as a communication medium. There was a limited number of SMEs which used the Internet for e-commerce purposes. The following sections describe the prevalent uses of the Internet.

E-mail

In the current study e-mail was defined as using the Internet as a communication medium. Table 3 shows that most SMEs (87%) are using e-mail and Figure 4 illustrates that they are mainly using email to communicate with customers (83.6%), suppliers (80.3%) and for internal communication purposes (63.9%). Dholakia and Kshetri (2004) wrote that SMEs often use mailing lists to update customers on their latest offerings and receive e-mail alerts from suppliers about product offerings.

Through e-mail, businesses are able to timeously disseminate information to customers and suppliers (Tan & Teo 1998) because it allows for global communication, and the ability to exchange multimedia documents, which is convenient and cost-effective (Poon & Strom 1997). Interestingly, a study conducted in New Zealand showed that, while external communication with customers and suppliers was significantly associated with using the Internet for business purposes, internal communication between staff was not associated to Internet adoption (Al-Qirim 2007).

E-commerce

Dholakia and Kshetri (2004) found that prior technology use, in the form of website ownership significantly contributes to the use of the Internet for e-commerce. The current study found that SMEs in the business-services sector are not fully exploiting the Internet for e-commerce purposes. The results in Figures 1 & 2 show that the majority of SMEs (69%) in the business-services sector do not have websites, and more than half (53%) are not listed in on-line directories. Being listed in on-line directories is a precursor to establishing an on-line presence, because this allows Internet savvy customers to search for businesses. Having an informational website is the first step to informing and attracting future customers (Tan *et al.* 2010), and falls into the early stages of integrating the Internet into routine business processes to enable e-commerce (Stansfield & Grant 2003).

In terms of using the Internet for trading (e-commerce), 13% of SMEs indicated that they sold goods or services on-line and one-quarter of the respondents reported that they purchased goods and services on the Internet (Table 4). More than half (54%) of SMEs indicated that they use the Internet to receive payments for services rendered, and 82% reported that they make use of Internet banking (Figure 3).

In this study, while some e-commerce activity was taking place, it was essentially in the form of Internet banking. Buying and selling of services was less common. This is consistent with the findings of Cragg *et al.* (2001) who reported that despite e-commerce offering an extensive list of applications for business use, advanced applications, such as on-line trading, are rarely used by SMEs. Similarly Xu *et al.* (2004) found that SMEs in developing countries were less likely to be using the Internet for buying and selling products and services to business partners.

Web-browsing

In this study web-browsing was defined as using the Internet to search for information. Table 4 shows that the Internet is predominantly used, as a tool, to search for information. In Figure 5 we see that the kinds of information SMEs are searching for include looking for suppliers (87%), finding out about competitors (89%), and doing industry or market research (85%).

Poon and Strom (1997) found that communications and information retrieval were primary reasons why SMEs were using the Internet. Not much had changed six years later when Stansfield and Grant (2003:23) reported that the 'main use for the Internet related technology is for undertaking research activities, in particular, looking for new suppliers and customers and finding out about the activities of competitors'. These findings are also consistent with even more recent studies which show that the Internet is mostly used for web-browsing and that the use of the Internet by SMEs for other more advanced activities is limited (Tan *et al.* 2010; Lee & McGuiggan 2009; Mohamad & Ismail 2009).

Objective 2: Factors Inhibiting Internet Adoption

While most SMEs (84%) acknowledged that the Internet was becoming increasingly relevant to their businesses, they felt that the main barriers to Internet adoption were concerns about the costs and complexity, issues around security, and lack of support when it comes to using the Internet (Table 5).

Cost and Complexity

Notable in the results is the number of SMEs that indicated that the costs of; electricity (95%), IT consultant services (63%), Internet access (63%) and equipment (54%), required to use the Internet were high (Table). There were significant associations between the cost of the Internet and the cost of equipment, where both variables were positively correlated. This implies that SMEs consider the high cost of the equipment required to use the Internet as the strongest reason why they consider using the Internet as expensive.

While 5% of SMEs indicated that they do not understand how the Internet works, there was a medium strength positive correlation between understanding the working of the Internet and the perception that the Internet is too complex. This means that the less the SME owner understood the Internet the more likely they were to consider it a complex tool. Similarly, Internet complexity was also significantly associated with a lack of information on how to use the Internet for business purposes.

Table 6 showed that the factors that influenced SMEs who were not using the Internet (non-adopters) were all related to cost, namely the cost of the Internet, the costs of IT consultants and the high cost of electricity. These results were significantly higher for non-adopters than adopters of Internet technologies.

Although many SME owners expressed interest in the potential of the Internet, they seemed far more concerned about the additional expense of adopting the Internet. Here again, the findings are consistent with studies conducted by Walczuch *et al.* (2000) in the Netherlands and Tan *et al.* (2010) in Malaysia. In contrast, Lee and McGuiggan (2009) found that costs were not a significant barrier to Internet adoption among Australian SMEs.

Information Security

There was a medium strength positive correlation and significant association between the perception that the Internet posed a security threat to businesses, and a lack of understanding of how the Internet works. The implication here is that the less the owner manager understood the working of the Internet the more likely they were to believe that it posed a security threat to their businesses.

Although there were no other significant associations with the other constructs, information security was highlighted as a concern among 55% of the SMEs (both adopters and non-adopters). These findings are consistent with a study conducted amongst Australian SMEs, where concerns for confidentiality and security of information were identified as a barrier to Internet adoption (Lee & McGuiggan 2009).

Lack of Government Support

The lack of support from government for SMEs to use the Internet was significantly associated with a lack of information on how to use the Internet for business purposes. This could mean that in the South African context, the SMEs see government agencies as important sources of information regarding business tools. Also, Lee and McGuiggan (2009) identified that SMEs were more likely to use the Internet to find out about government policy updates and that SMEs looked to the government as an important

source of information. The findings of the current study were similar to those of Chau and Kuan (2001) who found that SMEs in Hong Kong did not adopt the Internet because of lack of knowledge and skills, insufficient internal IT expertise and a lack of legislated support.

Limitations of the Study

There does not seem to be a single, comprehensive database of South African SMEs (de Klerk and Kroon, 2005). In this study the Durban Chamber of Commerce (DCC), South African Revenue services (SARS), Department of Trade and Industry for KwaZulu-Natal (DTI), eThekweni municipality and Durban City Engineers (DCE) were contacted. The City Engineers' department was the most helpful with regards to information about SMEs. However, while the City Engineers' office had a database of formally registered SMEs in the Durban region, it was not accessible to the researcher. Only staff members with proper clearance had access and the population size was based on what the researcher was told, hence the information was subject to human and counting errors beyond the control of the researcher.

The study focused on formally registered businesses and did not take into account those SMEs, which were not registered (i.e. SMEs in the informal economy). Furthermore, since there was no consistent definition of small business in the literature and policy documents, it was difficult to consistently determine the exact number of SMEs in the business-services sector. Finally, the response rate was 76.25% of the required sample size; hence the generalisability of the results to other SMEs in the business-services sector located in Durban is limited by the nature, small size and low response rate of the sample.

Recommendations

Government Support and Incentives

Most of the respondents reported that the government should give businesses more incentives to get on the Internet. Therefore government support in assisting SMEs in a developing context, should begin by creating a legal environment which is conducive for SMEs trading via the Internet. This

includes establishing appropriate Internet and e-commerce laws, and appropriate tax incentives for using the Internet. Additionally, 91% (Table 4) of the respondents indicated that government support in terms of Internet usage was lacking.

Hence government assistance should extend to formulating and implementing educational and training plans that aim to prepare SMEs to build up their technology competence, thus enabling them to adopt and integrate the Internet in their businesses for the purpose of e-commerce. This can be achieved through the development of a network of IT support agencies which provide education and training to SMEs. Moreover, government support should also include public awareness programmes that build upon the favourable sentiments towards the Internet among SMEs. This will emphasise the importance and benefits of the Internet, and its applications for the economic future of the South Africa.

Managerial Awareness

In this study most SMEs felt that the associated costs of acquiring the Internet were too high. Managers need to re-evaluate the benefits and costs of Internet adoption as the business environment changes. In the long-term, the benefits of Internet adoption outweigh the costs. Therefore an important message for SME owner/managers is to realize that, as businesses increasingly engage in e-commerce, SMEs will have more opportunities to compete in the global marketplace.

Conclusion

The study provided evidence that SMEs are aware of the advantages provided by the Internet. However, the short-term benefits are not apparent enough to SME owners for them to plan any significant investment in adopting Internet technologies.

The results of this study showed that, while the majority of SMEs in the business-services sector were engaging in Internet activities, these activities were limited to e-mail and web browsing. E-commerce (use of the Internet for trading purposes) was limited.

Important factors that influenced business-services SMEs' decision to adopt the Internet; included costs and complexity, information security, IT support, pressure from trading partners, and the perception of gaining a competitive edge. The role of government support in convincing SMEs of the benefits of the Internet, and assisting them to adopt and integrate the Internet into their businesses is essential.

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