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Barriers to Electronic Commerce Adoption in Small and Medium Enterprises: A Critical Literature Review

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Abstract

This study is attempting to determine if the barriers reported in early e-commerce researches differ from those found in recent e-commerce studies as well as exploring if

the resultant barrier groupings created from e-commerce barriers are dissimilar. To achieve our research's aim, an extensive literature review was conducted based on what we believe to be representative sample of some of the most cited pieces of research on this topic. The study concludes that though the issues inhibiting SMEs in their uptake of e-commerce are seemingly endless, the reality is that these issues have largely remained the same since the advent of e-commerce in the early 1990's. The implication of our study is that researchers should stop reinventing the list of e-commerce adoption barriers but instead focus their efforts on how SMEs can overcome these barriers so as to reap the full benefits of the technology.

Keywords: **SMEs, e-commerce, adoption barriers.**

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INTRODUCTION

Many researchers have identified numerous barriers/inhibitors confronting small and medium enterprises (SMEs) in their quest to adopt and assimilate electronic (e)-commerce applications in their operations (see for example, MacGregor and Vrazalic, 2005a; Scupola, 2003; Ihlstrum, Magnusson, Scupola and Tuunainen, 2003 and Stansfield and Grant, 2003a). A review of some of the most cited pieces of research on this topic, which inevitably has attracted immense academic and practitioner interest, reveals a seemingly infinite list of e-commerce adoption barriers with the emergence of new barriers not a far fetched possibility. MacGregor and Vrazalic (2004) and Ihlstrum et al (2003) echo the same sentiments by unequivocally stating that the barriers earlier reported in the late 1990's are still current in today's SMEs.

In view of this background, the purpose of this paper is to contribute to literature on e-commerce adoption and usage issues in SMEs, principally answering this basic research question: "are the issues confronting SMEs in their uptake and assimilation of e-commerce similar/dissimilar"? This is achieved by conducting an extensive literature review using a representative sample of some of the most cited research findings on this topic.

RESEARCH STRATEGY

This paper is largely based on an extensive review of literature on e-commerce barriers found in various studies. Our literature review is drawn from a representative sample of some of the most cited pieces of research findings on this topic. We classified these barriers into two time points (early 1990's to 1999 and 2000 and beyond). A critical analysis was done to determine the differences/similarities if any among the barriers reported in literature under the aforementioned time points.

REVIEW OF RELATED LITERATURES.

Electronic commerce (EC) and small and medium enterprises (SMEs)

It is undeniable that EC and SMEs are terms with no agreed definitions. Literature is

abounding with diverse attempts to define the two terms but what has generally emerged from these efforts is that these terms mean different things to different people (see for example Ihlstrum et al, 2003; Simpson and Docherty, 2004; Cloete, Courtney and Fintz, 2002, MacGregor and Vrazalic, 2004; Stansfield and Grant, 2003a and Bolongkikit, Obit, Asing and Tanakinjal, 2006). In view of the fact that this study reports on findings from a diverse sample, broad definitions of two the terms will be adopted. For the purposes of this study, SMEs are defined as businesses, which employ up to two hundred and fifty full time employees (European Parliament, 2000). Similarly, in this study e-commerce will be viewed within the context of performing any business process electronically (Stansfield and Grant, 2003a and b).

Various studies have reported that SMEs are generally lagging behind to large organizations as far as the adoption and usage of e-commerce is concerned (see for example Ihlstrum et al, 2003; Simpson and Docherty, 2004; Lowry, Singh and Scollary, 1999; Chau and Turner, 2002; Pease and Rowe, 2003b and Stockdale and Standing, 2006). This sluggish uptake and diffusion of the technology among SMEs conflicted with the commonly held view that SMEs have been noted for their ability to respond to new opportunities and innovations more quickly than larger enterprises (Lomerson, McGrath and Schwager, nd). Rao, Metts and Monge (2003) alluded to the fact that SMEs are generally considered to be flexible, adaptive and innovative making them a good fit for electronic commerce.

The slow uptake of EC by SMEs has been attributed to various barriers or impediments faced by these organizations (MacGregor and Vrazalic, 2005b and c; Pease and Rowe, 2003a and b and Simpson and Docherty, 2004). Many Governments attempt to dismantle some of the barriers faced by SMEs in adopting EC (Stansfield and Grant, 2003a). Despite the existence of these barriers, SMEs have no option but to adopt the technology (Payne, nd). It is a prerequisite for competing well in markets (MacGregor and Vrazalic, 2005a) and if the company does not exist on the Internet, it does not exist (Ihlstrum et al, 2003).

Barriers to e-commerce adoption in SMEs

In pursuance of the objectives of the study, the barriers to e-commerce adoption in SMEs will be explored in detail. These barriers will be discussed under two time periods: those reported at the onset of e-commerce (early 1990's to 1999) and those found in recent studies (2000 and beyond).

Early e-commerce adoption barriers in SMEs

Various sources of literature show that barriers to e-commerce adoption and diffusion in SMEs were initially reported in the period 1990 to 1999. Our discussion on early adoption barriers is inevitably confined to this period.

In an exploratory study of small business use of the Internet in New Zealand by Abell and Lim (1996) found that the main barriers inhibiting SMEs from adopting e-commerce are: the fact that target customers/suppliers are not yet connected, concerns about privacy and security issues associated with the use of the internet, decreased productivity of workers through frivolous use, enforceability of contracts negotiated over the network, lack of expertise or personnel, lack of belief that online marketing would be

effective, high connection or usage charges and technical limitations of hardware or software.

Poon and Swatman (1997) suggested that issues impeding the uptake of e-commerce in SMEs in Australia could be the cost of investment, concerns about security and payment systems, cultural barriers, infrastructure issues and lack of understanding on how the technology could affect their businesses. Lawrence (1997) in her study of factors affecting the utilization of e-commerce facilities in Tasmanian SMEs, found that the main inhibitors included high costs of implementation, lack of time to implement e-commerce, lack of perceived advantages of using e-commerce and heavy reliance on external consultants (who are often considered by small businesses to be inadequate) to provide necessary expertise.

In a study by OECD (1998) identified that other barriers are lack of awareness, uncertainty about benefits of e-commerce, concerns about security, lack of human resources and skills, set up costs and pricing issues. Similarly, Crawford (1998) reported that lack of time, awareness and business opportunities are the key inhibitors to e-commerce adoption by SMEs. Puro and Campbell (1998) suggested that the main issues that SMEs face involved security hazards, unfamiliarity with the internet, start up costs, lack of guidance about how to start the process and lack of perceived advantages in implementing e-commerce.

El-Nawawy and Ismail (1999) in their study of e-commerce adoption by SMEs in Egypt reported that the main factors revolve around awareness and education, market size, e-commerce infrastructure, telecommunications infrastructure, legal system, Government issues, affordability/cost structure and social and psychological factors. Lowry et al (1999) in a study of Australia SMEs reported on the concerns about security and reluctance by customers to purchase on line.

Hadjimanolis (1999) suggested that key issues are lack of critical mass among customers/suppliers/business partners, SMEs are uncertain of which hardware or software to choose, lack of suitability of e-commerce (not suited to products/services) or the way the SMEs/their clients do business. Van Akkeren and Cavaye (1999) identified that organizational resistance to change because of fear of new technology among employees, concern about return on investment (ROI), reluctance by SMEs to make substantial investments when short term returns are not guaranteed and mistrust of IT industry are also among the barriers adoption. The above issues are conveniently summarized in table 1 below.

Table 1: Early e-commerce barriers

Barriers to e-commerce adoption	Sources
▪ Owners lack awareness of the technology	OECD (1998), El-Nawawy and Ismail (1999), Crawford (1998)
▪ Lack of available information about EC	Lawrence (1997)
▪ Lack of business opportunities	Crawford (1998)
▪ Lack of time to implement e-commerce	Crawford (1998), Lawrence (1997), Van Akkeren and Cavaye (1999)

<ul style="list-style-type: none"> ▪ Concerns about security of e-commerce/payment systems 	Lowry et al (1999), Poon and Swatman (1997), Purao and Campbell (1998), Van Akkeren and Cavaye (1999) OECD (1998)
<ul style="list-style-type: none"> ▪ E-commerce yet to gain acceptance, lack of critical mass among customers/suppliers/business partners to implement e-commerce, Reluctance of customers to purchase online 	Lowry et al (1999), Hadjimanolis (1999) Abell and Lim (1996) Lowry et al (1999)
<ul style="list-style-type: none"> ▪ Unfamiliarity with the internet 	Purao and Campbell (1998)
<ul style="list-style-type: none"> ▪ Lack of senior people enthusiasm to use the technology 	Lowry et al (1999)
<ul style="list-style-type: none"> ▪ High costs of investment/implementation, connection, start up or usage 	Van Akkeren and Cavaye (1999), Lawrence (1997), Hadjimanolis (1999) Poon and Swatman (1997) Abell and Lim (1996) Purao and Campbell (1998) OECD (1998)
<ul style="list-style-type: none"> ▪ Cultural barriers 	Poon and Swatman (1997) Ling (1999)
<ul style="list-style-type: none"> ▪ Infrastructure issues, inadequate infrastructure (telecommunications and financial) 	Poon and Swatman (1997) El-Nawawy and Ismail (1999)
<ul style="list-style-type: none"> ▪ Lack of understanding of how the technology could affect their business, did not believe online marketing would be effective 	Poon and Swatman (1997) Abell and Lim (1996)
<ul style="list-style-type: none"> ▪ Uncertainty about benefits/advantages of e-commerce 	OECD (1998) Hadjimanolis (1999) Lawrence (1997) Purao and Campbell (1998)
<ul style="list-style-type: none"> ▪ Lack of technical skill and IT knowledge among employees 	OECD (1998), Van Akkeren and Cavaye (1999) Hadjimanolis (1999) Lawrence (1997) Abell and Lim (1996)
<ul style="list-style-type: none"> ▪ E-commerce is too complex to implement 	Lawrence (1997)
<ul style="list-style-type: none"> ▪ E-commerce is deemed not suitable for the product/service offered or the way SMEs/their clients do business 	Hadjimanolis (1999)
<ul style="list-style-type: none"> ▪ Not sure which hardware or software to choose, technical limitations of hardware and software 	Hadjimanolis (1999) Abell and Lim (1996)
<ul style="list-style-type: none"> ▪ Heavy reliance on external consultants (who are considered by small businesses to be inadequate) to provide necessary expertise 	Van Akkeren and Cavaye (1999) Lawrence (1997)
<ul style="list-style-type: none"> ▪ Small business require short term ROI and e-commerce is a long term 	Van Akkeren and Cavaye (1999)

investment, concern about ROI, reluctance to make substantial investments when short term returns are not guaranteed	Lawrence (1997)
▪ Inadequate legal systems, enforceability of contracts negotiated over the network	El-Nawawy and Ismail (1999) Abell and Lim (1996)
▪ E-commerce is perceived a technology lacking direction	Lawrence (1997)
▪ Decreased productivity through frivolous use	Abell and Lim (1996)
▪ Inappropriate pricing structure	El-Nawawy and Ismail (1999)
▪ Verification of authorship of message	Abell and Lim (1996)
▪ Resistance to change because of fear of new technology among employees	Lawrence (1997) Van Akkeren and Cavaye (1999)
▪ Government not taking a leading role. Lack of Government support/involvement	El-Nawawy and Ismail (1999), Ling (1999)
▪ Guarantee of message delivery	Abell and Lim (1996)
▪ Mistrust of IT industry	Van Akkeren and Cavaye (1999)
▪ Tampering wit network message	Abell and Lim (1996)
▪ Preference for and satisfaction with traditional manual methods	Lawrence (1997)
▪ Unauthorized access to internal networks	Abell and Lim (1996)
▪ Interception of network messages	Abell and Lim (1996)
▪ Lack of guidelines about how to start the process	Purao and Campbell (1998)

Recent e-commerce barriers in SMEs

E-commerce barriers reported in literature at the advent of the technology are confirmed in recent studies (2000 and beyond). However, literature is also abounding with new barriers reported from several studies on e-commerce adoption in SMEs. This section reports on e-commerce barriers reported in the period 2000 and beyond.

Debrick and Kraemer (2001) contended that the major factors inhibiting the uptake of e-commerce by SMEs are include inadequate transportation and delivery, limited diffusion of computers, lack of online payment processes, limited availability of banking services and uncertain taxation rules. Cloete (2002) and Cloete et al (2001) reported several factors which affect the adoption of e-commerce which include lack of information options, lack of time to investigate options, lack of access to computers, lack of access to hardware and software, limited knowledge of e-commerce models and methodologies.

Pracy and Cooper (2000) reports that all customers were local and had not asked for the technology. Brown (2002) contends that SMEs lack strategic vision and EC is perceived

a distraction from core business impedes e-commerce adoption. Kaynak et al (2005) report on the difficulty of finding and retaining qualified personnel with required skills and knowledge and the risk of dissipation of company specific knowledge.

Bolongkikit et al (2006) found among other issues that SMEs markets needed a high degree of human interaction, while Scupola (2003) contended that e-commerce is perceived a constant interruption and distraction, too many junk mails and technology change and evolution inhibit e-commerce adoption. Looi (2003) espoused that lack of external pressure from suppliers and customers inhibit e-commerce adoption. Similarly, Lawson et al (2003) contended that poorly trained staff and not being sure how many people are using the Internet impede the adoption and diffusion of electronic commerce among SMEs.

Lane et al (2004) reported that SMEs are not prepared to adopt e-commerce and web portals and that web based selling of goods and services are not yet practical. Taylor and Murphy (2004) argued that SMEs occupy small/clearly defined niche markets that do not need global connectivity through experimentation as inhibitors to e-commerce adoption. Table 2 below conveniently summarizes these barriers.

Table 2: Recent e-commerce adoption barriers in SMEs

Barriers to e-commerce	Sources
• Lack of suitable EC solutions for SMEs	Khan (2004), Kapurubandara and Lawson (2006)
• Problems in solving compatibility issues with existing IT system	Khan (2004)
• Difficulty in changing the existing working procedures or practices to match with EC adoption	Khan (2004)
• Inadequate transportation and delivery	Dedrick and Kraemer (2001)
• Limited diffusion of computers	Dedrick and Kraemer (2001)
• Lack of online payment process	Dedrick and Kraemer (2001)
• Limited availability of banking services	Dedrick and Kraemer (2001)
• Uncertain taxation rules	Dedrick and Kraemer (2001)
• Limited knowledge of e-commerce models and methodologies	Cloete, et al (2001), Cloete (2002)
• Lack of access to computers	Cloete, et al (2001) Cloete (2002)
• Lack of access to hardware and software	Cloete, et al (2001) Cloete (2002)
• Lack of time to investigate options	Cloete, et al (2001) Cloete (2002)
• Lack of information options	Cloete (2002) Cloete (2002)
• Difficulty finding and retaining qualified personnel with required	Kaynak et al (2005)

skills and knowledge	
• Risk of dissipation of company specific knowledge	Kaynak et al (2005)
• EC is a distraction from core business	Brown (2002), Scupola (2003)
• Lack of strategic vision	Brown (2002)
• Company markets need high degree of human interaction	Bolongkikit et al (2006)
• Too many junk e-mails	Scupola (2003)
• Technology change and evolution	Scupola (2003)
• Lack of external pressure from suppliers and customers	Looi (2003)
• Not sure how many people are using the internet	Lawson et al (2003)
• Customers have not asked for it	Pracy and Cooper (2000)
• Belief that all customers are local	Pracy and Cooper (2000)
• SMEs not prepared to adopt EC as a business concept	Lane et al (2004)
• Limited use of Internet banking and web portals by SMEs	Lane et al (2004)
• Web based selling of goods/services is not yet practical	Lane et al (2004)
• No resources for experimentation	Taylor and Murphy (2004)
• Some SMEs occupy small niche markets that do not need global connectivity through the internet	Taylor and Murphy (2004) Dixon et al (2002)
• No simple procedures and guidelines	Kapurubandara and Lawson (2006)
• No one stop shop facility	Kapurubandara and Lawson (2006)
• Unstable e-commerce climate in the country	Kapurubandara and Lawson (2006)
• Change in regulations with each Government	Kapurubandara and Lawson (2006)

DISCUSSION

Comparative analyses of early and recent e-commerce adoption barriers

Our first objective is to determine if the barriers reported at the advent of e-commerce differ from those found in recent studies. The following discussion highlights important observations from the literature review.

Firstly, most if not all the barriers reported in earlier studies have been reported in recent studies. Studies by Harindranath et al (2008), Lane et al (2004), Taylor and Murphy

(2004), Ramsey et al (2003), Pracy and Cooper (2000), Lawson et al (2003), Looi (2003), Owens and Beynon-Davies (2001), Scupola (2003), Bolongkikit et al (2006), Brown (2002), Walczuch et al (2000), Kaynak et al (2005), Andam (2003), Chen (2004), Cloete (2002) and Cloete et al (2001) confirmed the existence of that many of the barriers reported in the early 1990s. However, in addition to these barriers, a seemingly new breed of barriers is found in recent literature, begging us to answer this question **“Why is there a seemingly infinite list of e-commerce adoption barriers in SMEs?”** MacGregor and Vrazalic (2005a: 524) appear to concur with the emergence of a new list of barriers saying that the barriers “change over time”. On the other hand, Ihlstrum et al (2003:102) contended that these barriers remain the same since SMEs got involved in IT/IS.

Our grounding position is congruent with Ihlstrum et al’s (2003:102) stance stated earlier. For instance issues raised by Dedrick and Kraemer (2001) (see table 2 above) can be related/traced back to issues raised in early studies. Issues they raised include inadequate transportation and delivery, uncertain tax rules, limited diffusion of computers and limited availability of banking services. It is undeniable that these issues are related to earlier barriers of infrastructure issues (Poon and Swatman, 1997); inadequate legal systems (El-Nawawy and Ismail, 1999); lack of critical mass (Hadjimanolis, 1999) and inadequate infrastructure (El-Nawawy and Ismail, 1999) respectively.

Brown (2002) raised the concern that SMEs lack strategic vision and that they view e-commerce as a distraction from core business. These issues are related to the fact that e-commerce is perceived a technology lacking direction (Hadjimanolis, 1999) or lack of understanding of how the technology could affect their businesses (Poon and Swatman, 1997). Lane et al (2004) raised issues of limited use of Internet banking and web portals by SMEs, web based selling of goods/services not yet practical and that SMEs are not prepared to adopt e-commerce as a business concept. The first issue is related to lack of critical mass as highlighted by Abell and Lim (1996), while the second to the belief that e-commerce is deemed not suited to the products/services offered (Hadjimonolis, 1999) while the last one to the view that e-commerce is a technology which lacks direction (Lawrence, 1997).

Scupola (2002) observed that SMEs face issues of too many junk e-mails, technology change and evolves rapidly and that e-commerce is a constant interruption and distraction. These issues are linked to concerns about security (Purao and Campbell, 1998); lack of understanding of how the technology could affect their businesses (Poon and Swatman, 1997) and perception that the technology lacks direction (Lawrence, 1997) respectively.

CONCLUSIONS

This section presents the implications of the above discussion and draws implications from issues raised. While we do not claim to have conducted an exhaustive literature search of e-commerce barriers, it is our considered opinion that we consulted a representative sample of literature sources on this topic to warrant our conclusions valid.

The aims of the paper is to determine if the barriers reported at the advent of electronic commerce are different from those found in recent studies An extensive literature review was undertaken to achieve these aims.

With regard to the objective, what emerged from this debate is the fact that the adoption barriers confronting SMEs are the same between the two time points. Differences only come in the importance placed on each barrier by different SMEs in different locations and at different stages of adoption. For example SMEs in developed countries may value or place importance on barriers, which may not be necessarily, perceived so by SMEs in developing countries. Therefore, the implication of this study is that instead of researchers regenerating or re-inventing new barriers, they should channel their efforts to help SMEs in overcoming these existing barriers so as to realize benefits from e-commerce. Ihlstrum et al (2003:102) appeared to have properly summed it up by saying researchers should stop reinventing the wheel in the form of creating new lists of old barriers.

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