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Are the standard drivers for e-commerce adoption in regional SMEs really standard: a comparison of Australian, Swedish and US regional SMEs

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Abstract

The sluggish pace of E-commerce diffusion in the SME sector is well documented. In response to this, one area that has given rise to continued research is the development of criteria (drivers) for Ecommerce adoption in the SME sector. This research has given rise to a 'standard' set of drivers that has become the basis upon which research into E-commerce adoption in SMEs is carried out. While a number of studies have attempted to develop models of E-commerce adoption, little has been done to discover whether, indeed, these criteria are universal to the sector. This paper presents the findings of three studies of regional SMEs located in Australia, Sweden and the US to determine whether the drivers of adoption are perceived differently in different locations. The results show that the grouping of criteria, together with the priorities of those groupings, is substantially different across the three locations. The results raise the question as to whether criteria (drivers) of e-commerce adoption in regional SMEs can be thought of as universal or whether they are location specific.

Keywords

Are, Standard, Drivers, for, Commerce, Adoption, Regional, SMEs, Really, Standard, Comparison, Australian, Swedish, Regional, SMEs

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Are the Standard Drivers for E-commerce Adoption in Regional SMEs Really Standard: A Comparison of Australian, Swedish and US Regional SMEs

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Abstract

The sluggish pace of E-commerce diffusion in the SME sector is well documented. In response to this, one area that has given rise to continued research is the development of criteria (drivers) for E-commerce adoption in the SME sector. This research has given rise to a 'standard' set of drivers that has become the basis upon which research into E-commerce adoption in SMEs is carried out. While a number of studies have attempted to develop models of E-commerce adoption, little has been done to discover whether, indeed, these criteria are universal to the sector. This paper presents the findings of three studies of regional SMEs located in Australia, Sweden and the US to determine whether the drivers of adoption are perceived differently in different locations. The results show that the grouping of criteria, together with the priorities of those groupings, is substantially different across the three locations. The results raise the question as to whether criteria (drivers) of E-commerce adoption in regional SMEs can be thought of as universal or whether they are location specific.

Introduction

Despite their size, small to medium enterprises (SMEs) are increasingly turning to global markets. This development has been enabled by the advent of electronic commerce technology. There are numerous definitions of e-commerce in the literature, however, fundamentally e-commerce can best be described as "the buying and selling of information, products, and services via computer networks" (Kalakota & Whinston, 1997, p.3). E-commerce has the potential to become a source of competitive advantage to the SME sector because it is a cost effective way of accessing customers and being 'wired to the global marketplace'.

As with previous technologies, the SME sector, as a whole, has been slow to adopt E-commerce (Magnusson 2001, Poon & Swatman 1998, Van Akkeren & Cavaye 1999). Indeed, According to the National Research Council (2000), only 25% of SMEs had a web site in mid-1999. Of those that did have a web site,

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the revenue they generated via business-to-customer (B2C) e-commerce was negligible (Wall Street Journal, August 17, 1999 cited in National Research Council, 2000; Ruth, 2000). Similar findings were reported in Australia with only 22% of small businesses using the Internet for e-commerce (Telstra, 1999).

As with the adoption of previous technologies into the SME sector, there have been a variety of studies, both at an academic level as well as through government initiatives. Some of those studies have concentrated on barriers to adoption, some have examined the criteria or driving-forces behind E-commerce adoption by SMEs, while others have examined the benefits SMEs have derive from the uptake of the technology. This paper begins by examining the nature of SMEs, in particular those in regional settings. A discussion of the criteria for adoption of E-commerce, based on previous research is presented. Finally, the paper presents three studies of regional SMEs located in Australia, Sweden and the USA to determine whether criteria for E-commerce adoption are perceived differently in different locations, and identify any common underlying factors.

The nature of small to medium enterprises (SMEs)

There are a variety of definitions pertaining to what constitutes a small to medium enterprise. Some of these definitions are based on quantitative measures such as staffing levels, turnover or assets, while others tend to employ a qualitative approach. Meredith (1994) suggests that any description or definition must include a quantitative component that takes into account staff levels, turnover, assets together with financial and non-financial measurements, but that the description must also include a qualitative component that reflects how the business is organised and how it operates.

Not only is there a myriad of views concerning the nature of SMEs, but, from a governmental standpoint there are a variety of definitions of small to medium enterprises.

These include:

'Small business is one in which one or two persons are required to make all of the critical decisions (such as finance, accounting, personnel, inventory, production, servicing, marketing and selling decisions) without the aid of internal (employed) specialists and with owners only having specific knowledge in one or two functional areas of management.' (Meredith, 1994, pp 31)

'An SME shall be deemed to be one which is independently owned and operated and which is not dominant in its field of operation.' (United States Small Business Administration 1953)

'Having fewer than 50 employees and is not a subsidiary of any other company.' (United Kingdom)

Not only do the definitions of SME vary, but there are wide ranging views on the characteristics of SMEs.

There have been many studies in the literature that have attempted to demonstrate the characteristics of SMEs. Central to all of these studies is the underlying realization that many of the processes and techniques that have been successfully applied to large businesses, do not necessarily provide similar outcomes when applied to SMEs. This is perhaps best summed up by Barnett & Mackness (1983) who stated that SMEs are not small large businesses, but are unique in their own right.

It is appropriate that we examine some of the characteristics found in the literature.

Brigham & Smith (1967) found that SMEs tended to be more risky than their larger counterparts. This view is supported in later studies (Walker, 1975, Delone, 1988). Cochran (1981) found that SMEs tended to be subject to higher failure rates while Rotch (1987) suggested that SMEs had inadequate records of transactions. Welsh & White (1981), in a comparison of SMEs with their larger counterparts found that SMEs suffered from a lack of trained staff and had a short-range management perspective. They termed these traits 'resource poverty' and suggested that their net effect was to magnify the effect of environmental impact, particularly when information systems were involved.

These early suggestions have been supported by more recent studies that have found most SMEs lack technical expertise (Barry & Milner 2002), most lack adequate capital to undertake technical enhancements (Gaskill et al (1993, Raymond 2001), most SMEs suffer from inadequate organisational planning (Tetteh &

Burn 2001, Miller & Besser 2000) and many SMEs differ from their larger counterparts in the extent of the product/service range available to customer (Reynolds et al (1994).

A number of recent studies (see Reynolds et al (1994), Murphy (1996, Bunker & MacGregor 2000) have examined the differences in management style between large businesses and SMEs. These studies have shown that among other characteristics, SMEs tend to have a small management team (often one or two individuals), they are strongly influenced by the owner and the owner's personal idiosyncrasies, they have little control over their environment (this is supported by the studies of Westhead & Storey (1996 and Hill & Stewart 2000) and they have a strong desire to remain independent (this is supported by the findings of Dennis 2000 and Drakopolou-Dodd et al 2002).

Based on an extensive review of the literature, a summary of the features unique to SMEs is shown in Table 1. An analysis of the features revealed that they could be classified as being internal or external to the business. Internal features include management, decision making and planning processes, and the acquisition of resources, while external features are related to the market (products/services and customers) and the external environment (risk taking and uncertainty).

ID	FEATURES UNIQUE TO SMEs	REPORTED BY	INTERNAL FEATURES
	Features Related to Management, Decision Making and Planning Processes		
INT 1	SMEs have small and centralised management with a short range perspective	Markland (1974) Reynolds et al (1994) Bunker & MacGregor (2000) Welsh & White (1981)	
INT 2	SMEs have poor management skills	Bili & Raymond (1993)	
INT 3	SMEs exhibit a strong desire for independence and avoid business ventures which impinge on their independence	Dennis (2000) Reynolds et al (1994)	
INT 4	SME Owners often withhold information from colleagues	Dennis (2000)	
INT 5	The decision making process in SMEs is intuitive, rather than based on detailed planning and exhaustive study	Reynolds et al (1994) Bunker & MacGregor (2000)	
INT 6	The SME Owner(s) has/have a strong influence in the decision making process	Reynolds et al (1994) Murphy 1996 Bunker & MacGregor (2000)	
INT 7	Intrusion of family values and concerns in decision making processes	Dennis (2000) Bunker & MacGregor (2000) Reynolds et al (1994)	
INT 8	SMEs have informal and inadequate planning and record keeping processes	Reynolds et al (1994) Tetteh & Burn (2001) Miller & Besser (2000) Markland (1974) Rotch (1981)	
INT 9	SMEs are more intent on improving day-to-day procedures	MacGregor et al 1998	
	Features Related to Resource Acquisition		
INT 9	SMEs face difficulties obtaining finance and other resources, and as a result have fewer resources	Cragg & King (1993) Welsh & White (1981) Gaskill & Gibbs (1994) Reynolds et al (1994) Bili & Raymond (1993)	
INT 10	SMEs are more reluctant to spend on information technology and therefore have limited use of technology	Walczuch et al (2000) Dennis (2000) MacGregor & Bunker (1996) Poon & Swatman (1997) Abell & Limm (1996) Brigham & Smith 1967	

INT 11	SMEs have a lack of technical knowledge and specialist staff and provide little IT training for staff	Martin & Matlay (2001) Cragg & King (1993) Bunker & MacGregor (2000) Reynolds et al (1994) Welsh & White (1981) Bili & Raymond (1993)	EXTERNAL FEATURES
	Features Related to Products/Services and Markets		
EXT 1	SMEs have a narrow product/service range	Bunker & MacGregor (2000) Reynolds et al (1994)	
EXT 2	SMEs have a limited share of the market (often confined towards a niche market) and therefore heavily rely on few customers	Hadjimonolis (1999) Lawrence (1997) Quayle (2002) Reynolds et al (1994)	
EXT 3	SMEs are product oriented, while large businesses are more customer oriented	Reynolds et al (1994) Bunker & MacGregor (2000) MacGregor et al (1998)	
EXT 4	SMEs are not interested in large shares of the market	Reynolds et al (1994) MacGregor et al (1998)	
EXT 5	SMEs are unable to compete with their larger counterparts	Lawrence (1997)	
	Features Related to Risk Taking and Dealing with Uncertainty		
EXT 6	SMEs have lower control over their external environment than larger businesses, and therefore face more uncertainty	Westhead & Storey (1996) Hill & Stewart (2000)	
EXT 7	SMEs face more risks than large businesses because the failure rates of SMEs are higher	Brigham & Smith (1967) DeLone (1988) Cochran (1981)	
EXT 8	SMEs are more reluctant to take risks	Walczuch et al (2000) Dennis (2000)	

Table 1: Features unique to small to medium enterprises (SMEs)

SMEs in Regional Areas

SMEs located in regional areas are affected by circumstances inherent to their location. Regional areas are defined as geographical areas located outside metropolitan centres and major cities. The Australian Bureau of Statistics (2001) classifies regional areas into inner and outer regions, remote and very remote areas. Determining the classification of a region is based on a formula which primarily relies on the measures of proximity to services. Rather than remote and rural areas (which are sparsely populated), the research presented in this paper focuses on inner and outer regional areas (which are more urbanised).

Regional areas are of particular interest to governments because they are characterised by high unemployment rates (Larsson et al, 2003), a shortage of skilled people, limited access to resources and a lack of infrastructure (Keniry et al, 2003). Yet, at the same time, businesses located in regional areas in Australia contribute 50% of the national export income (Keniry, 2003). This implies that small businesses have the potential to play a major role in developing regional areas. The European Union views small businesses as a catalyst for regional development (Europa, 2003). In 2001, the Swedish Parliament passed legislation that resulted in the creation of Regional Development Councils (Johansson, 2003). The Councils have a mandate to promote a positive business climate and sustainable growth in their respective regions. SMEs have been earmarked as playing an important role in promoting this growth because they are seen as a key source of jobs and employment prospects (Keniry et al, 2003; Larssen et al, 2003). Subsequently, government organisations have been heavily promoting the adoption of information and communication technology (ICT), including e-commerce, by SMEs. However, barriers to adoption still remain.

Criteria for the adoption of E-commerce by SMEs

In their study of 146 SMEs Poon & Swatman (1997) provided 5 'drivers' or criteria for E-commerce adoption by respondents. These were: new modes of direct or indirect marketing, strengthening of relationships with

business partners, the ability to reach new customers, improvement to customer services and the reduction of costs in communication. Similar studies have been carried out in a variety of SME communities. Some of the criteria for adoption and use have been similar to those found by Poon & Swatman, others have provided alternative responses. Abell & Limm (1996) found that reduction in communication costs, improvement in customer services, improvement in lead time and improvement in sales were the major criteria for E-commerce adoption and use, adding that external technical support was considered vital to any adoption and use strategies.

Lawrence (1997), in an examination of Tasmanian SMEs noted that improved marketing and the ability to reach new customers were the most common incentives for adopting and using E-commerce. Lawrence also noted that decisions concerning E-commerce adoption were often forced onto SMEs by their larger trading partners. This is supported by studies carried out MacGregor & Bunker (1996), MacGregor, Bunker & Waugh (1998), Reimenschneider & Mykytyn (2000) and Raymond (2001).

Auger & Gallagher (1997) noted that improvement in customer services and improvement to internal control of the business were strong criteria for E-commerce adoption in SMEs. The strong desire for control was also noted in studies carried out by Reimenschneider & Mykytyn (2000), Poon & Joseph (2001) and Domke-Damonte & Levsen (2002).

A number of studies (Reimenschneider & Mykytyn 2000, Price-Waterhouse Cooper 1999, Power & Sohal 2002) have found that some SMEs have adopted E-commerce nominating pressure from customers as one of the motivating criteria.

Table 2 is an initial, exploratory attempt at determining the relationships between the unique features and IT adoption strategies of SMEs and the driving forces for the adoption of E-commerce. Further research is required to fully establish the nature of this relationship.

Table 2

Summary of Research on Criteria Used by SME's in the Decisions to Adopt and Use Electronic Commerce

Criteria	Researcher
Demand/Pressure from Customers	Reimenschneider & Mykytyn 2000 Price Waterhouse Coopers 1999 Power & Sohal 2002
Pressure of competition	Raisch 2001 Poon & Strom 1997
Pressure from Suppliers	Reimenschneider & Mykytyn 2000 MacGregor & Bunker 1996b Lawrence 1997 Raymond 2001
Reduction of costs	Abell & Limm 1996 Raisch 2001 Auger & Gallagher 1997
Improvement to customer service	Abell & Limm 1996 Senn 1996 Auger & Gallagher 1997 Power & Sohal 2002
Improvement in lead time	Power & Sohal 2002 Reimenschneider & Mykytyn 2000 Abell & Limm 1996
Increased sales	Abell & Limm 1996 Lee 2001 Phan 2001

Improvement to internal efficiency	Porter 2001
Strengthen Relations with Business Partners	Raymond 2001 Evans & Wurster 1997 Poon & Swatman 1997
Reach new customers/markets	Poon & Swatman 1997 Lawrence 1997 Power & Sohal 2002 Reimenschneider & Mykytyn 2000
Improve competitiveness	Turban et al 2000 Raymond 2001 Reimenschneider & Mykytyn 2000
External Technical Support	Abell & Limm 1996
Improve marketing	Poon & Swatman 1997 Lawrence 1997 Power & Sohal 2002 Reimenschneider & Mykytyn 2000
Improve control and follow-up	Reimenschneider & Mykytyn 2000 Domke-Damonte & Levsen 2002 Poon & Joseph 2001 Auger & Gallagher 1997

Methodology

14 of the most commonly occurring criteria for E-commerce adoption were identified from the literature./ A series of 6 in-depth interviews with regional small businesses were undertaken to determine whether the criteria were applicable and complete. All identified criteria were found to be applicable and no additional criteria were forthcoming.

Based on the six in-depth interviews, a survey instrument was developed to collect data about e-commerce adoption criteria (amongst other things). Respondents who had adopted e-commerce were asked to rate the importance of each criterion to their decision to adopt e-commerce (as shown in Figure 1 below) using a standard 5 point Likert scale. The Likert scale responses were assumed to possess the characteristics of an interval measurement scale for data analysis purposes.

40. This question relates to the reasons why your organisation decided to implement e-commerce. Below is a list of statements indicating possible reasons. Based on your opinion, please rank each statement on a scale of 1 to 5 to indicate how important this reason was to your decision to implement e-commerce, as follows:

- 1 = the reason was very unimportant to your decision to use e-commerce**
- 2 = the reason was unimportant to your decision to use e-commerce**
- 3 = the reason was neither unimportant nor important to your decision to use e-commerce**
- 4 = the reason was important to your decision to use e-commerce**
- 5 = the reason was very important to your decision to use e-commerce**

Our organisation uses e-commerce because:	Rating			
Demand and/ or pressure from customers.	1 5	2	3	4
The pressure from competition in the line of business.	1 5	2	3	4
The suppliers offered better terms.	1 5	2	3	4
To reduce costs.	1 5	2	3	4
To improve customer service.	1 5	2	3	4
To shorten lead-time and to reduce stock.	1 5	2	3	4
To increase sales.	1 5	2	3	4
To improve internal efficiency.	1 5	2	3	4
To strengthen relations with business partners.	1 5	2	3	4
The possibility to reach new customers/markets.	1 5	2	3	4
To improve our competitiveness.	1 5	2	3	4
We were offered external support at the introduction.	1 5	2	3	4
To improve our marketing.	1 5	2	3	4
To improve possibilities of control and follow-ups.	1 5	2	3	4

Figure 1: Question about drivers to e-commerce adoption used in survey

The study was primarily concerned with SMEs located in regional areas, especially since no other research has investigated e-commerce adoption barriers in these areas specifically. As a result, this study was conceived primarily as exploratory in nature. Sweden, Australia and USA were chosen to carry out the study for several reasons. All of the countries have a large number of SMEs located in regional areas and the governments of these countries are keen to promote e-commerce adoption by SMEs. Furthermore, all of the countries are classified by the World Bank Group as high income nations and members of the Organisation for Economic Co-operation and Development (OECD). A set of location guidelines was developed in order to choose a specific region in each country. These were: the location must be a large regional centre rather than a capital city; a viable government initiated chamber of commerce must exist and be well patronised by the SME community; the location should have the full range of educational facilities; the business community represented a cross-section of business ages, sizes, sectors and market foci; the SME community included those that had adopted as well as not adopted e-commerce.

Three locations were chosen, Karlstad (Sweden), Wollongong (Australia), and Salt Lake City (Utah, USA). All three locations met the guidelines and each location contained personnel who could assist with the distribution and collection of the survey instrument. A total of 1170 surveys were distributed by post in four regional areas of Sweden: Karlstad, Filipstad, Saffle and Arvika. A total of 250 surveys were administered by telephone in Wollongong and a total of 150 surveys were administered by telephone in the USA. The mode of the data collection was selected based on previous research by de Heer (1999) which indicated that Scandinavian countries (including Sweden) had historically high survey response rates (although he notes that this is declining). Therefore, a low cost mail survey was used in Sweden, while the more expensive mode of phone surveys was used in Australia and the USA to ensure higher levels of participation.

Results

Responses were obtained from 313 SME organisations giving a response rate of 26.8%. From these, 275 responses were considered to be valid and usable. The total number adopters (i.e. SMEs using e-commerce) was 152, representing 55.3% of the valid responses. Responses were obtained from 289 SMEs in Australia giving a higher response rate of 65.6% which is consistent with phone surveys (Frazer & Lawley, 2000). In Australia the total number of adopters was 91, representing 31.5% of the valid responses. The responses of the adopters were examined in detail and it was determined that all 91 had responded to all questions regarding criteria for adoption. Responses were obtained from 116 small business organisations in the US giving a response rate of 77.3%. The total number adopters was 69, representing 59.5% of the valid responses. The responses of the non-adopters were examined in detail and it was determined that all 69 responded to every statement in the question regarding criteria to e-commerce adoption. The responses formed the basis for the statistical analysis carried out using SPSS. An inspection of the frequencies indicated, in all three locations, that the full range of the scale was utilised by the respondents (i.e. every criterion had at least one instance of each rating from 1 to 5).

The aim of the statistical analysis was to establish the correlations between e-commerce adoption criteria in the data set. The results are shown in Tables 3-5. The criteria have been abbreviated and correspond to the criteria in Figure 1 above. Correlations significant at the .001 level are shown in bold.

Table 3
Criteria Correlations Sweden

	A	B	C	D	E	F	G	H	I	J	K	L	M
B	.644												
C	.335	.466											
D	.456	.513	.594										
E	.517	.539	.429	.726									
F	.319	.408	.578	.666	.541								
G	.377	.411	.423	.590	.657	.521							
H	.354	.415	.401	.643	.615	.550	.517						
I	.503	.501	.528	.564	.704	.567	.570	.544					
J	.397	.443	.406	.466	.681	.469	.738	.461	.628				
K	.481	.635	.488	.602	.711	.569	.673	.590	.756	.752			
L	.251**	.347	.465	.400	.283	.446	.373	.307	.414	.300	.409		
M	.392	.436	.385	.410	.622	.384	.682	.454	.547	.829	.675	.341	
N	.383	.449	.507	.653	.579	.626	.520	.552	.551	.529	.622	.489	.444

Table 4
Criteria Correlations Australia

	A	B	C	D	E	F	G	H	I	J	K	L	M
B	.497*												
C	.516**	.408*											
D	.384	.074	.437*										
E	.476*	.203	.224	.313									
F	.506*	.322	.455*	.431*	.402*								
G	.666	.517**	.434*	.466*	.600**	.584**							
H	.432*	.336	.432*	.426*	.578**	.595**	.781						
I	.334	.097	.128	-.039	.318	.012	.326	.162					
J	.602**	.593**	.239	.238	.494*	.519**	.833	.642**	.193				
K	.568**	.619**	.442*	.356	.574**	.486*	.893	.752	.321	.895			
L	.434*	.373	-.066	.178	.447*	.238	.427*	.193	.447*	.438*	.386		
M	.576**	.267	.196	.434*	.598**	.423*	.667	.470*	.297	.780	.736	.461*	
N	.598**	.353	.497*	.360	.657	.617**	.711	.789	.247	.644**	.751	.141	.617**

Table 5
Criteria Correlations USA

	A	B	C	D	E	F	G	H	I	J	K	L	M
B	.221												
C	.146	.365**											
D	.134	.533	.339**										
E	.044	.031	.160	.065									
F	.099	.389**	.230	.127	.180								
G	.232	.552	.454	.154	.135	.710							
H	.305*	.320*	.294*	.247	.040	.259	.510						
I	.276*	.493	.325*	.396**	-.034	.594	.576	.501					
J	.230	.561	.378**	.223	.161	.561	.810	.438**	.655				
K	.049	.621	.223	.293*	.002	.443**	.524	.330*	.546	.677			
L	.260	-.084	.015	-.035	.194	.017	-.044	.016	-.061	-.045	-.043		
M	.052	.072	.253	.047	.091	.072	.023	.257	-.028	-.067	-.068	.369*	
N	.154	-.067	.098	.055	.204	-.122	-.067	.132	-.152	-.115	-.110	.307*	.557

Legend

- A. Demand and/ or pressure from customers.
- B. The pressure from competition in the line of business.
- C. The suppliers offered better terms.
- D. To reduce costs.
- E. To improve customer service.
- F. To shorten lead-time and to reduce stock.
- G. To increase sales.
- H. To improve internal efficiency.
- I. To strengthen relations with business partners.
- J. The possibility to reach new customers/markets.
- K. To improve our competitiveness
- L. External support
- M. To improve our marketing.
- N. To improve possibilities of control and follow-ups.

These findings suggested the use of Factor Analysis to investigate any separate underlying factors and to reduce the redundancy of certain criteria indicated in the Correlation Matrices. The results of the Kaiser-Meyer-Olkin MSA (.911 for Sweden, .652 for USA, .751 for Australia) and Bartlett's test for Sphericity (Sphericity ($\chi^2 = 1820$, $p = .000$ for Sweden, $\chi^2 = 250$, $p = .000$ for Australia and $\chi^2 = 283$, $p = .000$ for the US) indicated that the data set satisfied the assumptions for factorability. Principle Components Analysis was chosen as the method of extraction in order to account for maximum variance in the data using a minimum number of factors. A two factor solution was extracted for Sweden with Eigenvalues 7.767 and 1.204. The two factors accounted for 64.079% of the variance. A three factor solution was extracted for Australia with Eigenvalues 7.154, 1.585 and 1.101. The three factors accounted for 70.280% of the variance. A four factor solution was extracted for the USA with Eigenvalues 4.352, 2.150, 1.272 and 1.118. The four factors accounted for 63.517% of the variance. All three were supported by the Scree plots These can be seen in Table 6.

Table 6 Total Variance Explained

Comp	Eigenvalue			% of Variance			Cumulative %		
	SW	AUS	USA	SW	AUS	USA	SW	AUS	USA
1	7.767	7.154	4.432	55.482	51.098	31.082	55.482	51.098	31.082
2	1.204	1.585	2.150	8.596	11.321	15.360	64.079	62.419	46.443
3		1.101	1.272		7.861	9.085		70.280	55.528
4			1.118			7.989			63.517

The resulting components were rotated using the Varimax procedure and a simple structure was achieved as shown in the Rotated Component Matrix (Tables 7, 8 & 9).

Table 7 Rotated Component Matrix (Sweden)

	Component 1 Market Forces & Marketing	Component 2 Internal Business
Criteria		
Demand and/ or pressure from customers.	.498	.354
The pressure from competition in the line of business.	.490	.483
The suppliers offered better terms.	.221	.748
To reduce costs.	.401	.750
To improve customer service.	.740	.435
To shorten lead-time and to reduce stock.	.300	.766
To increase sales.	.755	.335
To improve internal efficiency.	.467	.553
To strengthen relations with business partners.	.632	.513
The possibility to reach new customers/markets.	.892	.194
To improve our competitiveness.	.762	.458
We were offered external support at the introduction.	.118	.675
To improve our marketing.	.866	.144
To improve possibilities of control and follow-ups.	.390	.704

Table 8 (Australia)

	Component 1 Internal Business	Component 2 Marketing	Component 3 Competition
Criteria			
Demand and/ or pressure from customers.	.475	.361	.499
The pressure from competition in the line of business.	.052	.150	.928
The suppliers offered better terms.	.557	-.269	.491
To reduce costs.	.748	-.017	-.068
To improve customer service.	.602	.570	.006
To shorten lead-time and to reduce stock.	.698	.028	.315
To increase sales.	.656	.434	.487
To improve internal efficiency.	.773	.184	.299
To strengthen relations with business partners.	-.002	.690	.059
The possibility to reach new customers/markets.	.461	.490	.587
To improve our competitiveness.	.575	.441	.583
We were offered external support at the introduction.	.016	.798	.209
To improve our marketing.	.565	.611	.172
To improve possibilities of control and follow-ups.	.782	.237	.314

Table 9 (USA)

	Component 1 Internal Efficiency	Component 2 Market Forces & Marketing	Component 3 Cost & Competitiveness	Component 4 Customer Service
Criteria				
Demand and/ or pressure from customers.	.332	.497	.134	-.336
The pressure from competition in the line of business.	.500	-.062	.635	-.009
The suppliers offered better terms.	.195	.183	.497	.415
To reduce costs.	.033	-.034	.883	-.028
To improve customer service.	.141	.210	.030	.775
To shorten lead-time and to reduce stock.	.799	-.112	-.082	.208
To increase sales.	.855	.026	.038	.168
To improve internal efficiency.	.500	.423	.153	-.306
To strengthen relations with business partners.	.736	-.052	.270	-.232
The possibility to reach new customers/markets.	.865	-.062	.152	.111
To improve our competitiveness.	.646	-.121	.323	-.024
We were offered external support at the introduction.	.011	.644	-.163	.135
To improve our marketing.	-.307	.750	-.060	.074
To improve possibilities of control and follow-ups.	-.134	.754	.153	.196

As can be seen in Table 7, the Swedish respondents grouped criteria for adoption into either Market Forces & Marketing or Internal Business. Table 8 shows that the Australian respondents 'split' marketing and market forces across two factors, termed Competition and Marketing. An examination of the US data shows a very different picture. US respondents grouped cost and competition together. They considered that reaching new markets was part of being internally efficient, yet grouped the actual task of marketing with gaining help from outside the business. Finally, the US respondents considered improvement to customer service was a separate stand-alone factor.

Discussion

Before examining the groupings of factors in detail, a number of comments are appropriate. Firstly, while the groupings of barriers differ from one location to another, the results suggest that each of the ten barriers is applicable to SMEs in regional areas. Secondly, despite each of the three locations satisfying conditions for classification as regional, the uptake of e-commerce is vastly different from location to location. 53.3% of the regional Swedish SMEs surveyed had adopted e-commerce, 59.5% of the regional US SMEs had done likewise, while only 31.5% of the Australian SMEs had done so. A number of explanations are possible. One explanation is that there is a deliberate 'push' by some governments to develop professional and voluntary organisations and courses to 'ease small business into ecommerce'. This is supported by a number of recent studies (see for example Barry et al, 2003). A second explanation is supported by studies carried out in UK, US and Australia (see for example Gibb, 2000) who found that there is a willingness by SMEs in the US and UK to seek alternative approaches to marketing and technology. This was not found in Australia.

A number of authors (see for example Martin & Matlay, 2001) have noted that, among other factors, the location of the SME does have a bearing on the decision-making process when it comes to the adoption of e-commerce. The study results show that while all 14 criteria may be applicable to regional SMEs in Sweden, Australia and the USA, the groupings and priorities of those criteria differ widely between the three locations. An examination of Table 8 criteria Suppliers offered better terms & Reduction of Costs are both loaded onto the internal business factor. By comparison, the US respondents loaded these separately onto the Cost/Competition factor. Similarly, while both the Swedish and Australian respondents loaded Improvement to Customer Services onto the Marketing factor, the US respondents considered this to be a uniquely separate factor. Table 9 shows that the criteria Improvement to Marketing and Improvement to Control & Follow-up are loaded to the same factor in the US study, while Pressure from Competition and Pressure from Customers were loaded onto separate factors. For the Swedish and Australian respondents the reverse is the case.

As already indicated, there have been a number of criticisms levelled at government-developed methodologies aimed at assisting SMEs to adopt ecommerce (see Martin & Matlay, 2001; MacGregor, 2004; MacGregor & Vrazalic, 2004). Foremost in these criticisms has been that most governments, and most methodologies developed by governments, view the SME sector as largely homogeneous. This research shows that in regard to regional SMEs, this is not the case. While three locations were deliberately chosen for their apparent similarity, not only was the uptake of e-commerce different, but the groupings of reasons for that uptake differed as well.

Limitations

It should be noted that the study presented here has several limitations. The data for the study was collected from various industry sectors so it is not possible to make sector specific conclusions. Also, the choice of variables selected for the study is somewhat problematic because of the complex nature of adoption barriers which change over time. Furthermore, according to Sohal and Ng (1998), the views expressed in the surveys are of a single individual from the responding organisation, and only those interested in the study are likely to complete and return the survey. Finally, this is a quantitative study, and further qualitative research is required to gain a better understanding of the key issues.

Conclusion

The main aim of this paper was to determine whether criteria for e-commerce adoption were standard and thus perceived in the same way by SME owner/managers in different, but inherently similar locations. A study of SMEs in regional Sweden, Australia and US was undertaken. The results showed that not only are the groupings of criteria different across the three locations, but the priorities of those factors differ as well. Despite the similarities between the three countries in terms of their economic development, SMEs have different concerns in relation to e-commerce adoption criteria.

The implications of the study are significant for government organisations engaged in promoting e-commerce adoption, especially in regional SMEs. This research suggests that SME variations exist depending on the location of the small business. This would suggest that any strategies developed to promote e-commerce in SMEs located in different areas should address criteria differently. Further research needs to take place, both to address the reasons behind the differences and possible solutions to alleviate the concerns of SMEs.

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