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# Small business adoption of E-commerce: a comparison of B2B and B2C businesses

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# Small Business Adoption of E-commerce: A Comparison of B2B and B2C Businesses

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## ABSTRACT

This paper examines why both B2B and B2C small businesses adopt of E-commerce. It provides an examination of the association between B2B/B2C adoption and other organizational and managerial factors by questioning small business managers about business sector, market focus, gender of the CEO and educational level of the CEO. It also examines the groupings and priorities of criteria used in the decision-making process to adopt E-commerce, to determine whether differences exist between those small businesses that operate primarily in a B2B mode and those that operate primarily in a B2C mode.

## KEYWORDS

SME, B2B, B2C, E-Commerce.

## INTRODUCTION

A number of studies (Jennex et al., 2004; Turban et al., 2004, 2002; Duffy & Dale, 2002; Marr, 2000) have attempted to examine the differences between organizations that operate as B2B and B2C E-commerce firms. A closer examination of many of these studies, however, show that they are either prescriptive in their approach – detailing the necessary functions that must be addressed by firms undertaking one or other form of E-commerce (Duffy & Dale, 2002; Marr, 2000); or process-descriptive - detailing the day-to-day activities of firms that have undertaken one or other of the forms of E-commerce (Kesselyeck, 2000; Torris et al., 2000; Daniel et al., 2000; Gann, 1999). While these studies may be of interest to the small business manager intent on adopting E-commerce, for the researcher into small business use of E-commerce, they provide little in the way of reasons behind the small firm's decision to develop a B2B or B2C orientation.

## THE NATURE OF SMALL TO MEDIUM ENTERPRISES (SMES)

There are many definitions of SMEs. Many have been developed by governments and are 'universal' across all sectors of business (see for example Australia and UK), while others vary from business sector to business sector. As this study examines SMEs in Sweden, the Swedish model is used, viz., a business is deemed small in Sweden if it has 50 or less employees (Gustafsson et al., 2001).

Not only has there been debate concerning business size, a number of studies have attempted to examine the specific nature of SMEs. 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 magnified by environmental impact, particularly when information systems were involved.

A number of recent studies (see Reynolds et al., (1994), Murphy, 1996; Bunker & MacGregor, 2000; MacGregor et al., 2004) 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; 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 both small and medium firms (commonly referred to as SMEs). This is shown as Table 1. As such, under the definition used in this paper (less than 50 employees), it is accepted that the small businesses in this study would exhibit features as listed in Table 1. An analysis of these 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
<i>Features Related to Management, Decision Making and Planning Processes</i>			
INT 1	SMEs have small and centralised management with a short range perspective	Reynolds et al., (1994) Bunker & MacGregor, (2000) Welsh & White, (1981) Bunker & Yin, (2005)	
INT 2	SMEs have poor management skills	Blili & Raymond, (1993) Bunker & Yin, (2005)	
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) Bunker & Yin, (2005)	
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) Rotch, (1981) Bunker & Yin, (2005)	
INT 9	SMEs are more intent on improving day-to-day procedures	MacGregor et al., 1998	
<i>Features Related to Resource Acquisition</i>			
INT 9	SMEs face difficulties obtaining finance and other resources, and as a result have fewer resources	Welsh & White, (1981) Reynolds et al., (1994) Blili & Raymond, (1993) Bunker & Yin, (2005)	
INT 10	SMEs are more reluctant to spend on information technology and therefore have limited use of technology	Dennis, (2000) 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) Bunker & MacGregor, (2000) Reynolds et al., (1994) Welsh & White, (1981) Blili & Raymond, (1993) Chau & Turner, (2004)	

<i>Features Related to Products/Services and Markets</i>		<b>EXTERNAL FEATURES</b>	
<b>EXT 1</b>	SMEs have a narrow product/service range		Bunker & MacGregor, (2000) Reynolds et al., (1994)
<b>EXT 2</b>	SMEs have a limited share of the market (often confined towards a niche market) and therefore heavily rely on few customers		Lawrence, (1997) Quayle, (2002) Reynolds et al., (1994)
<b>EXT 3</b>	SMEs are product oriented, while large businesses are more customer oriented		Reynolds et al., (1994) Bunker & MacGregor, (2000)
<b>EXT 4</b>	SMEs are not interested in large shares of the market		Reynolds et al., (1994) MacGregor et al., (1998)
<b>EXT 5</b>	SMEs are unable to compete with their larger counterparts		Lawrence, (1997) Chau & Turner, (2004)
<i>Features Related to Risk Taking and Dealing with Uncertainty</i>			
<b>EXT 6</b>	SMEs have lower control over their external environment than larger businesses, and therefore face more uncertainty		Westhead & Storey, (1996) Hill & Stewart, (2000)
<b>EXT 7</b>	SMEs face more risks than large businesses because the failure rates of SMEs are higher		Brigham & Smith, (1967) DeLone, (1988) Cochran, (1981)
<b>EXT 8</b>	SMEs are more reluctant to take risks		Dennis, (2000) Chau & Turner, (2004)

**Table 1 - Features unique to small to medium enterprises (SMEs)**

### **E-COMMERCE AND SMES**

E-commerce brings with it changes in communication (Chellappa et al., 1996; Bunker & Yin, 2005), business method (Henning, 1998; Bunker & Yin 2005), market structure and approach to marketing (Giaglis et al., 1999; Bunker & Yin, 2005) as well as changes in day-to-day activities (Doukidis et al., 1998; Chau & Turner, 2004). These changes are exacerbated in the SME sector as many SMEs have no overall plan and, for the most part, fail to understand the need for competitive strategies (Jeffcoate et al., 2002).

For SMEs, the changes associated with E-commerce have produced both positive and negative effects. Studies by Raymond, (2001) and Ritchie & Brindley, (2000) found that, while E-commerce adoption has eroded trading barriers for SMEs, this has often come at the price of altering or eliminating commercial relationships and exposing the business to external risks. Lawrence, (1997); Tetteh & Burn, (2001); Lee, (2001) and Bunker & Yin, (2005) contend that E-commerce adoption fundamentally alters the internal procedures within SMEs.

A number of studies have examined the criteria or driving-forces that have led SMEs to adopt E-commerce. Poon and Swatman, (1997) derived a list of five drivers or criteria for e-commerce adoption based on data collected from the respondents. These include: new modes of direct or indirect marketing, strengthening of relationships with business partners, the ability to reach new customers, improvements to customer services and the reduction of communication costs. Other studies have derived similar criteria. Abell and Lim, (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 by SMEs in New Zealand. Bunker and Yin, (2005) found that reduction in costs, improvement in customer service, improved marketing and improved competitiveness all contributed to the adoption and use of e-commerce by Australian small businesses. For brevity and convenience, these studies are summarised in Table 2

Criteria	Researcher
Demand/Pressure from Customers	Reimenschneider & Mykytyn, 2000
Pressure of competition	Raisch, 2001
Pressure from Suppliers	Reimenschneider & Mykytyn, 2000; Lawrence, 1997; Raymond, 2001
Reduction of costs	Raisch, 2001; Bunker & Yin 2005
Improvement to customer service	Reimenschneider & Mykytyn, 2000; Bunker & Yin 2005
Improvement in lead time	Reimenschneider & Mykytyn, 2000
Increased sales	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; Reimenschneider & Mykytyn, 2000
Improve competitiveness	Turban et al., 2000; Raymond, 2001; Reimenschneider & Mykytyn, 2000; Bunker & Yin, (2005)
External Technical Support	Abell & Limm; 1996
Improve marketing	Poon & Swatman, 1997; Lawrence, 1997; Power & Sohal, 2002; Reimenschneider & Mykytyn, 2000; Bunker & Yin, (2005)
Improve control and follow-up	Reimenschneider & Mykytyn, 2000; Domke-Damonte & Levsen, 2002

**Table 2 - Criteria considered by SMEs in the decision to adopt and use e-commerce**

## METHODOLOGY

A series of 6 in-depth interviews was undertaken to determine whether the list of criteria (see Table 2) was applicable and complete. All criteria were found to be applicable and no additional criteria were forthcoming. Based on the findings of the interviews a questionnaire was developed which aimed to, amongst other things, determine whether B2B and B2C small business managers had differing priorities in the criteria that led to E-commerce adoption. Based on the issues highlighted from the literature, respondents were asked to rate 14 criteria (see appendix A for criteria definition). Respondents were also asked whether their business was primarily B2B or B2C, the size of the business (0 employees, 1-9 employees, 10-19 employees, 20-49 employees, >50 employees), the sector of the business (industrial, service, retail, finance, other), the gender of the CEO, the education level of the CEO (no formal education, high school/trade only, university), whether they had adopted a website and whether they had adopted E-commerce i.e. information technology used to transact business inter-organisationally.

A total of 1170 surveys were distributed by post to randomly selected small businesses in the Värmland county of Sweden: Karlstad, Filipstad, Säffle and Arvika.

## RESULTS

Responses were obtained from 350 SME organisations giving a response rate of 26.8%. From these, 313 responses were considered to be valid and usable. The total number adopters (i.e. SMEs using e-commerce) was 189, representing 53.8% of the valid responses. All usable responses satisfied the Swedish definition of a small business (< 50 employees). Respondents that were primarily B2B have been named B2B, respondents that were primarily B2C have been named B2C.

By way of profiling the respondents, a series of chi-square tests was undertaken to determine whether there was any association between B2B/B2C and business sector, market focus, gender of the CEO, educational level of the CEO of E-commerce adoption. In all cases, the chi-square tests followed the assumption that respondents occupied one and only one cell of the matrix. Tables 3 – 7 provide the results.

<b>B2B/B2C</b>	<b>B2B</b>	<b>B2C</b>
<b>Business Sector</b>		
<b>Industrial</b>	77	2
<b>Service</b>	100	14
<b>Retail</b>	31	26
<b>Finance</b>	2	7
<b>Other</b>	23	20

**Table 3 – Association between business sector and B2B/B2C**

**P= .000 (12 missing)**

An examination of Table 3 provides some expected and some unexpected results. As might be expected, the retail and finance sectors are slightly more aligned to the B2C approach to business, with 62.5% of respondents in the retail sector indicating that they mainly deal with individual customers rather than businesses. The results for the industrial and service sectors, however, show that respondents in these sectors are far more ‘geared’ towards B2B business rather than B2C. Indeed, only 3% of the industrial sector indicated that they dealt mainly with individual customers.

<b>B2B/B2C</b>	<b>B2B</b>	<b>B2C</b>
<b>Market Focus</b>		
<b>Local</b>	91	58
<b>Regional</b>	21	7
<b>National</b>	92	4
<b>International</b>	36	3

**Table 4 - Association between B2B/B2C and market focus**

**P= .000 12 missing**

As might be expected in Table 4, B2C businesses tend to be focussed on local markets (81.5 %), while B2B businesses are far more focussed on national and international markets. Indeed, while 51% of these B2B small businesses indicated their major focus on national or international markets, only 8.5% of B2C businesses were primarily aimed at the larger marketplace.

<b>Gender of CEO</b>	<b>Male</b>	<b>Female</b>
<b>B2B/B2C</b>		
<b>B2B</b>	215	20
<b>B2C</b>	54	16

**Table 5 - Gender and B2B/B2C firms**

**P<.05- 8 missing**

An examination of Table 5 shows that while 78% of male owned/managed small businesses pursued B2B business, only 46.7% of female owned/managed businesses were likewise engaged.

<b>B2B/B2C</b>	<b>No Formal Education</b>	<b>High School/Trade</b>	<b>University</b>
<b>B2B</b>	24	85	115
<b>B2C</b>	13	33	24

**Table 6- Education level and B2B/B2C Firms**

**p < .05 - 19 missing**

Table 6 provides an interesting set of results. The data shows that 58.6% of those small businesses that had owner/managers without any formal educational qualification were engaged primarily in B2B business. By comparison, 69.8% of those whose owner/manager had a high school or trade qualification and 81.7% of those whose owner/manager had a university qualification indicated that they were primarily engaged in B2B business.

Type	Adoption of E-commerce	Non-Adoption of E-commerce
B2B	144	96
B2C	39	33

**Table 7 - Association Between B2B and B2C and the adoption of E-commerce**

**Not significant -1 missing**

An examination of the data in Table 7 shows that while 60% of those businesses that were engaged in B2B business had adopted E-commerce, the B2C respondents were, at best, equivocal.

The responses were then subdivided between those that indicated the business was operating in B2B mode or B2C mode as many of the respondent businesses could be operating in the same mode simultaneously. In order to avoid any preconceived groupings, a factor analysis was applied to both sets of data separately to determine the nature and composition of underlying factors for the 14 criteria as they applied to each e-commerce mode of operation i.e. B2B and B2C. The results of the Kaiser-Meyer-Olkin MSA (.900 for B2B and .862 for B2C) and Bartlett's test for Sphericity ( $\chi^2 = 1302$   $p=.000$  for B2B and  $\chi^2 = 559$   $p=.000$  for B2C) 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 three factor solution with eigenvalues 7.282, 1.274 and 1.092 was extracted for the B2B respondents. This accounted for 68.913% of the variance. A two factor solution with eigenvalues 9.156 and 1.333 was extracted for the B2C respondents. This accounted for 74.921% of the variance. These can be seen in Table 8.

Component	Eigenvalues		% Variation		Cumulative %	
	B2B	B2C	B2B	B2C	B2B	B2C
1	7.282	9.156	52.011	65.397	52.011	65.397
2	1.274	1.333	9.098	9.524	61.109	74.921
3	1.092		7.804		68.913	

**Table 8 - Total variation explained**

The resulting components were rotated using the Varimax procedure and a simple structure was achieved as shown in the Rotated Component Matrices (Tables 9 and 10).

Criterion	Component 1 Marketing	Component 2 Internal Business	Component 3 Market Forces
A	.219	.098	.839
B	.283	.288	.782
C	.111	.667	.364
D	.342	.759	.219
E	.693	.384	.248
F	.301	.768	.107
G	.752	.327	.097
H	.423	.629	-.022
I	.591	.359	.447
J	.871	.206	.142
K	.714	.383	.375
L	.035	.483	.395
M	.851	.122	.192
N	.335	.732	.179

**Table 9 - Rotated component matrix (B2B)**

Criterion	Component 1 Market Forces & Marketing	Component 2 Internal Business
A	.811	.220
B	.810	.205
C	.444	.702
D	.522	.670
E	.764	.534
F	.246	.887
G	.687	.542
H	.618	.545
I	.417	.767
J	.860	.299
K	.706	.598
L	.123	.872
M	.777	.277
N	.401	.728

**Table 10 - Rotated Component Matrix (B2C)**

**Legend (these relate to the criteria listed in Appendix A)**

- A. Demand and/ or pressure from customers.
- B. The pressure from competition in the line of business
- C. Pressure from the suppliers.
- 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

**DISCUSSION**

An examination of Tables 9 and 10 shows a number of interesting findings. Firstly and perhaps most obviously, where B2C respondents produced a two factor solution, termed Market Forces & Marketing and Internal Business, the B2B respondents separated market forces and marketing into two separate and distinct factors. Secondly, while B2B respondents clearly delineated each of the criteria into specific factors, 5 factors (reduced costs, improved customer service, increased sales, improved internal efficiency and improvement to competitiveness) loaded almost equally onto both factors for the B2C respondents. The use of factor analysis for hypothesis testing would normally require the removal of items that cross loaded on more than one factor. However, a number of studies (Costello & Osborne 2005, Rummel 1988, Hair et al 1998) have suggested that even with an orthogonal rotation, correlation of factors is both common and acceptable in social science styled studies.

The results of this study are significant in several ways. Firstly, as no preconceived determination was made concerning the groupings of criteria, the final orthogonal rotation matrices more closely depict the views of the respondent SMEs. Secondly, the analysis has shown that 14 of the most common criteria for adoption of E-commerce can be grouped into either 2 factors (B2C) or 3 factors (B2B). This gives researchers a powerful explanatory tool because it reduces the “noise” in the data. Instead of accounting for 14 different criteria, the drivers to e-commerce adoption can be explained as a result of two of three factors: internal business, marketing and market forces. The Rotated Component Matrix also enables the prediction of the scores of each individual criterion based on the score of the two factors, and vice versa, for a small business. This has implications for research into e-commerce criteria. Whereas before researchers have identified various criteria (such as the

ones listed in Appendix A), this is the first time a study has shown that certain criteria can be logically grouped according to two or three factors. This makes it simpler not only to explain, but also predict drivers to e-commerce adoption in SMEs.

The other significant finding from the study is that not only does it appear that B2B/B2C is associated with business factors such as gender of the CEO and educational level of the CEO, the decision-making approaches to the adoption of E-commerce can be seen to be quite different between small businesses that are primarily B2B in nature and those that are B2C in nature.

## CONCLUSION

The aim of this paper was twofold: to examine whether factors such as business sector, market focus, gender of the CEO and educational level of the CEO were associated with B2B/B2C adoption; and to examine whether the grouping and priorities of criteria to adopt E-commerce differed depending on whether the small business primarily operated in a B2C style or a B2B style. The data showed that an association between business sector, market focus, gender of the CEO, educational level of the CEO and B2B/B2C was in evidence. Further investigation is required to identify the exact nature of this relationship. It was found that the 14 criteria could be loaded onto 2 factors for B2C businesses and 3 factors for B2B businesses, with market forces as the extra factor. The results of this study are a significant contribution to the research of e-commerce barriers because they can be used as explanatory and predictive tools by researchers.

The study presented in this paper is only one part of a larger long-term project investigating the drivers and barriers to e-commerce adoption in SMEs. Further research is currently being undertaken in Australia and the US to determine whether these findings are unique to the Swedish situation or are in evidence elsewhere.

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## Appendix A - Question Rating the Criteria

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