

RUC

Roskilde
University

SMEs' E-commerce Adoption

Perspectives from Denmark and Australia

Scupola, Ada

Published in:
Journal of Enterprise Information Management

DOI:
[10.1108/17410390910932803](https://doi.org/10.1108/17410390910932803)

Publication date:
2009

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Scupola, A. (2009). SMEs' E-commerce Adoption: Perspectives from Denmark and Australia. *Journal of Enterprise Information Management*, 22(1-2), 152-166. <https://doi.org/10.1108/17410390910932803>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

Take down policy

If you believe that this document breaches copyright please contact rucforsk@ruc.dk providing details, and we will remove access to the work immediately and investigate your claim.

SMES' E-COMMERCE ADOPTION: PERSPECTIVES FROM DENMARK AND AUSTRALIA

Ada Scupola

Department of Communication, Business and Information Technologies,

Roskilde University

Hus 23.1, Universitetsvej 1, DK-4000 Roskilde

Denmark

Tel: +45-46 74 25 98

e-mail: ada@ruc.dk

*Published in Journal of Enterprise Information Management, Vol. 22 (1-2),
2009*

SMES' E-COMMERCE ADOPTION: PERSPECTIVES FROM DENMARK AND AUSTRALIA

Abstract

Purpose – Proposes providing an insight about factors affecting business-to-business e-commerce adoption and implementation in small to medium-sized enterprises (SMEs), highlighting similarities and differences between Danish and Australian SMEs.

Design/methodology/approach – The research is based on a wide literature review, focused on proposing a theoretical model of technological, environmental and organizational factors influencing e-commerce adoption and implementation. Subsequently, a questionnaire based on the research model has been developed and face-to-face interviews were conducted in Danish and Australian companies.

Findings – The findings both corroborate previous results about significant factors affecting SMEs' b-to-b e-commerce adoption and implementation and provide new, interesting insights. The study also finds many similarities and differences between Denmark and Australia.

Research limitations/implications – The main limitation relates to the difficulty of generalization of the findings to a larger population of SMEs. To overcome this, a statistical survey is planned to be conducted in the future.

Practical implications – The results of the empirical research provide indication to SMEs interested to adopt b-to-b e-commerce, large companies interested to conduct e-commerce transactions with small and medium size companies and policy makers.

Originality/value – This paper both contributes to enhancing the understanding of the factors affecting business-to-business e-commerce adoption and implementation in SMEs and provides some interesting perspectives from Denmark and Australia.

Key words: Adoption, E-commerce, Internet, SMEs, Denmark, Australia, Policy

Paper type-Research paper

1 INTRODUCTION

Small and medium size enterprises (SMEs) are crucial for the economic performance and development of any country and are an important source of flexibility and innovation (OECD, 2002). SMEs represent between 96% and 99% of the total number of enterprises in most OECD countries. In Australia, SMEs account for about one third of GDP and 70% of total employment. In Denmark, SMEs account for almost 100% of the firms and account for 70% of total employment (OECD, 2000).

There are many definitions of SMEs. For Australia the Australian Bureau of Statistics' definition is adopted according to which a small and medium size business is any business employing less than 200 employees (www.abs.gov.au). As for Denmark, the European Parliament definition is adopted according to which SMEs are businesses with up to 250 employees (OECD, 2002).

SMEs can widely benefit from e-commerce (OECD, 2000; OECD, 2002). Here e-commerce is defined as "the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks" (Zwass, 1997). The focus is on transactions conducted over the Internet and World Wide Web and on business-to-business e-commerce. According to OECD (2000) even though SMEs are increasingly adopting e-commerce, their use and exploitation is still limited and small companies have a limited understanding of its potential. Therefore the major purpose of this study is to investigate the following research question: "What are the significant drivers and inhibitors of business-to-business e-commerce adoption and implementation in SMEs?" To answer the research question, empirical data were collected in the metropolitan areas of Brisbane in Australia and Copenhagen in Denmark. These two countries are interesting because they are representative of other developed economies with respect to SMEs' e-commerce adoption. Nevertheless there are still differences between them.

The article is structured as follows. This section has introduced the motivation and purpose of the study. The second section discusses the importance of the selection of Australia and Denmark and gives a short overview of these countries' e-commerce policy initiatives. The third section argues for the study theoretical importance and develops a conceptual model for the investigation of the research question. The fourth section presents and justifies the research method and the data collection process. The following section presents the study results, while the last section discusses the findings, limitations and conclusions of the study.

2 DANISH AND AUSTRALIAN BACKGROUND

Many studies have addressed governmental support for e-commerce adoption as government policies and especially ICT policies can, if successfully implemented, promote the uptake and adoption of e-commerce among SMEs (e.g. OECD, 2002; Papazafeiropoulou, 2004; Al-Qirim, 2006; Scupola, 2005). Given the purpose of the study, the Australian and Danish ICT policies in relation to SMEs are briefly reviewed here. In Australia, a key policy objective has been to create the conditions for improvement of the economic environment and growth prospects for SMEs, among which to reach a widespread use of e-commerce (OECD, 2002). A number of specific ICT policy initiatives and interventions have been undertaken among which The Building on IT Strengths (BITS) Incubator program, the National Technology Online program (ITOL), the Business Entry Point (www.business.gov.au) and the online Business

Resources Facility that collects information regarding starting and running a business including training (OECD, 2002).

In Denmark, the government has developed a set of measures to improve SMEs competitiveness including regulatory reforms to simplify rules and regulations for example through the introduction of e-government. Regarding ICT policy, the Danish government aim is to collaborate with industry and commerce association to enhance IT and e-commerce diffusion. In April 2002 the Danish government introduced the IT and telecommunication policy plan entitled: “IT for All: Denmark’s Future” (OECD, 2002). The report highlights seven major policy areas that should strengthen the use of IT and e-commerce in SMEs including enhanced use of IT in corporate Denmark, a competitive telecommunications sector, strong IT competency, an IT-based public sector and IT security. Specific initiatives include a nation-wide network of Technological Information Centers to provide free information, advice and assistance to SMEs and an online portal for SMEs’ self-assessment of export readiness (OECD, 2002). Table 1 provides some statistics about e-commerce in Australian and Danish SMEs.

Item	Denmark	Australia
SMEs purchasing on the Internet and other computer networks	30% (with employees between 10-50) 50% (with employees between 50-249)	Circa 20% (with employees between 10-19) Circa 30% (with employees above 20)
SMEs selling on the Internet or other computer networks	Circa 25% (with employees between 10-249)	Less than 10% (with employees between 0-10 employees) Between 10 and 20% (firms with more than 10 employees)

Table 1: E-commerce use by SMEs in Denmark and Australia; The data do not distinguish b-to-b from b-to-c e-commerce or EDI (Source: OECD 2002)

3 THEORETICAL BACKGROUND AND A RESEARCH MODEL

The generic innovation characteristics and organizational characteristics are strong predictors of IT adoption by both individuals and organizations (Jeyaraj et al., 2006). According to Rogers (1983:21), adoption is a decision to make full use of an innovation as the best course of action whereas rejection is a decision not to adopt an available innovation. In this study, adoption is defined as *the decision to make use of b-to-b electronic commerce to conduct business or transaction with trading partners*. There are two levels of adoption. Initially, innovation must be purchased, adopted and acquired by an organization. Subsequently, it must be accepted by the ultimate users in that organization also called implementation (Chong and Bauer, 2000; Rogers, 1995). Many studies have been conducted that investigate factors affecting e-commerce adoption in SMEs (see section 3.1, 3.2. and 3.3). They group these factors in different ways. In this study by following the technology, organizational, and environmental (TOE) framework developed by Tornatsky and Fleischer (1990), I group these factors into environmental, technological and organizational. Previous studies have also used this framework in the context of IT adoption in SMEs (e.g. Ramdani and Kawalek, 2007; Scupola 2003; Lertwongsatien and Wongpinunwatana, 2003; Premkumar, 2003; Kuan and Chau, 2001). These studies are important and significant for the purpose of this study because they theoretically and empirically identify a number of factors affecting IT and e-commerce adoption in SMEs. However, as the rate of e-commerce adoption and diffusion among SMEs

increases and consequently SMEs become more acquainted and sophisticated in incorporating e-commerce in their operations it can be expected that the drivers and inhibitors of e-commerce adoption and implementation change as a result. Therefore still the need of empirical studies to monitor the status quo. It is expected that the results of this study can be of interest to researchers, small and large companies and policy makers.

3.1 Technological Environment Context

The technological context represents the pool of technologies available to a firm for adoption. These can be both the technologies available on the market and the firms' current equipment. The decision to adopt a technology depends not only on what is available on the market, but also on how such technologies fit with the technologies that a firm already possesses (Tornatsky and Fleischer, 1990; Chau and Tam, 1997; Jeyaraj et al., 2006). Rogers (1995) found that perceived relative advantage (perceived electronic commerce benefits and impact), compatibility (both technical and organizational), trialability (the degree to which electronic commerce can be pilot tested), complexity (ease of use or learning electronic commerce) and observability (the extent to which relative advantage or gains are clear) of the technological innovation were important technological factors influencing the adoption decision. Previous studies (e.g. Chong and Bauer, 2000; Jeyaraj et al., 2006) show that these technological factors have been the key feature of several information technology adoption studies (e.g. Iacovou et al., 1995). A thorough literature review of factors affecting e-commerce adoption in SMEs shows that the most significant factors are relative advantage such as perceived benefits and barriers (e.g. Iacovou et al., 1995; Scupola, 2003 ; Kuan and Chau, 2001; Thong, 1999; Mirchandani and Motwani 2001), and e-commerce related technologies (e.g. Scupola, 2003). Therefore these factors are included in the model of fig. 1.

3.2 Organizational Environment Context

The organizational context represents the factors internal to an organization influencing an innovation adoption and implementation (Tornatsky and Fleischer, 1990). Some of the organizational factors more cited in the literature are organizational size (Iacovou et al., 1995) and organizational structure (Jeyaraj et al., 2006). The successful adoption and implementation of technological innovations within organizations has been often related to the support of top management (e.g. Jeyaraj et al., 2006; Sabherwal et. al., 2006) or the product champion (Thong, 1999; Jeyaraj et al., 2006). Other important factors are organizational readiness (e.g. Iacovou et al., 1995). Finally the communication process which an organization uses to communicate knowledge and persuasion of technology adoption has been extensively investigated in the literature as an important adoption and implementation factor (Rogers, 1995; Tornatsky and Fleischer, 1990). A thorough literature review of factors affecting SMEs e-commerce adoption shows that the most significant factors include top management support, CEO characteristics (Mirchandani and Motwani; 2001; Dholakia and Kshetri, 2004, Thong, 1999), employees' IS knowledge and attitude (Sabherwal et. al., 2006; Thong, 1999; Mirchandani and Motwani, 2001), and resource constraints such as financial and human resources of the firm (Iacovou, 1995; Tornatsky and Fleischer, 1990). Therefore these factors are included in the model of fig. 1. By following Thong (1999), CEO characteristics are identified here with CEO's innovativeness and CEO's IS knowledge and attitude. In fact, "unless the CEO has the will to innovate there is little that other members of the business can do to expedite IS adoption or increase the

extent of adoption (Thong, 1999, p. 191). By following Sabherwal et al. (2006, p. 1851), top management support is defined here as favorable attitude towards e-commerce in general, while employees' IS knowledge and attitude includes employees' attitude towards e-commerce, employees' experience with e-commerce and employees' formal and informal e-commerce training. Table 2 summarizes previous studies supporting these factors as significant determinant of IT adoption.

Variable	Studies
CEO characteristics and Top Management Support	Thong (1999); Thong and Yap (1995); Mirchandani and Motwani (2001); Rai and Howard, 1994); Sabherwal et. al. (2006); Jeyaraj et al. (2006); Scupola (2003)
Employees' IS Knowledge and Attitude	Sabherwal et. al. (2006); Thong (1999); Jeyaraj et al. (2006); Taylor and Todd (1995); Scupola (2003)

Table 2: Overview of studies supporting CEO Characteristics, Top Management Support and Employees' IS knowledge and attitude as significant determinant of IT adoption

3.3 External environment

The external environment is the arena in which an organization conducts its business. Two major environmental pressures in SMEs' e-commerce adoption are pressure from trading partners such as suppliers and customers and competitive pressure (e.g. Iacovou et al., 1995; Jeyaraj et al., 2006). Other factors affecting e-commerce adoption and diffusion are national factors. For example past studies have shown that innovations diffuse differently depending on the country socio-cultural environment. Other important factors are the level of national infrastructure and government involvement in fostering e-commerce adoption (e.g. Al-Quirim, 2006; Papazafeiropoulou, 2004). A thorough literature review shows that significant external factors that might influence SMEs' e-commerce adoption are competitive pressures (Dholakia and Kshetri, 2004; Zhu et al., 2003), pressure from trading partners such as buyers and suppliers (Iacovou et al., 1995; Grandon and Pearson, 2003), the role of government (Kuan and Chau, 2001; Scupola, 2005), and technology support infrastructure such as access and quality of ICT consulting services (Scupola, 2003). Therefore they are included in the model in fig. 1.

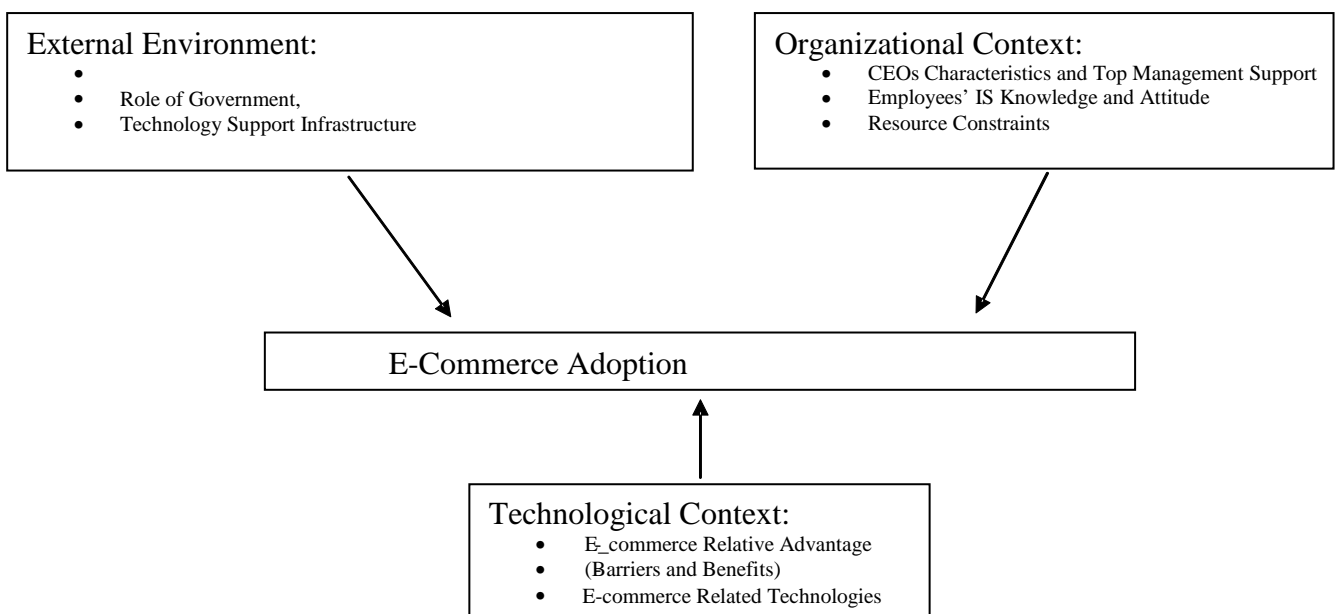


Fig. 1: A Model of E-Commerce Adoption in SMEs (Adapted from Scupola, 2003)

4 RESEARCH APPROACH AND DATA COLLECTION

A critical issue in answering the research question was whether to use a quantitative research method such as a survey or a qualitative research method such as the case study. Here the choice to use a qualitative research method has been made because the study's main intention was to identify "the significant drivers and inhibitors of business-to-business e-commerce adoption and implementation in SMEs". This has been done by conducting a thorough literature review of studies investigating such factors and by conducting preliminary qualitative interviews with CEOs and key SMEs managers dealing with e-commerce adoption. In a second phase the author intends to use these study results to conduct a comprehensive survey in the area of Brisbane and Copenhagen to further test these qualitative results. This research design has been successfully employed in similar studies (Chong and Bauer, 2000). Miles and Huberman (1994) also state that strengths of the qualitative data are their focus on "naturally occurring, ordinary events in natural settings...and provide "thick descriptions" that are vivid, nested in real context and are also well suited for locating the meanings people place on events, processes and structures" (p. 10).

4.1 Data Collection

The data collection included library searches, face-to-face focused interviews, documentary information such as companies' reports and companies' web sites. Following Yin (2003) focused interviews have been used because "their major purpose is to corroborate certain facts that already have been established (Yin, 2003, p.90)". By following Iacovou et al. (1995), to enhance validity summaries of each interview' major findings were verified by the participants after the end of each interview session. To increase reliability an interview protocol was used and a database was developed (Yin, 2003). The protocol questions were organized into two parts. The first captured company background information such as type of business, years in business, level of e-commerce adoption and e-commerce activities. This information were supplemented by information provided on companies' web site, annual reports, sales brochures and other material provided by the companies. The second part specifically aimed at collecting information about the significant factors affecting adoption of e-commerce. These questions were derived from the technology, environment and organization contexts of the Tornatsky and Fleischer's (1990) model (Fig. 1). For example within the environmental context, the questions focused on role of competitors, suppliers, buyers, government, and technology support infrastructure in the adoption and extent of implementation of e-commerce in the company. However, even though the interviews focused on these categories, the respondent was free to talk about other factors as

well. In addition, each interview ended by inviting the respondent to add anything else that could have affected e-commerce adoption in his/her company. The interviews lasted for about 1 hour. All interviews were tape-recorded and transcribed. Notes were also taken during the interviews. The interviews were conducted with CEOs and managers responsible for e-commerce adoption and implementation. By following Miles and Huberman (1994, p. 58) a provisional “start list” of codes was created prior to the field work to guide the analysis. The coding was manual. This “start list” came from the conceptual framework and the research question. Specifically it was based on three main categories corresponding to the three contexts of the research model of fig.1 (technological, organizational and environmental contexts). Codes and sub-codes were also generated. New codes emerged progressively during the data collection, uncovering new factors not included in the model. For example the factors of the technological context provided in Table 5 were mostly empirically generated during the data collection phase under the different sub codes of e-commerce barriers, benefits and e-commerce related technologies. Specific analytic techniques included putting information into different arrays, making matrixes of categories and placing evidence within such categories (Yin, 2003; Miles and Huberman, 1994). The qualitative data obtained from the interviews was analyzed using the strategies outlined in Miles and Huberman (1994). By following Chong and Bauer (2000) and Iacovou et al. (1995) a factor is considered to be significant if it was perceived by the respondent to have influenced e-commerce adoption and implementation.

4.2 Company Selection Process

To investigate the research question four SMEs in each country were selected and interviewed. The selection criteria were the following: 1) the firms had to have already adopted and implemented B-to-B e-commerce or had intent to do so. Similarly to Zhu et al. (2003) a firm is considered to have intent if it plans to implement e-commerce within 2 years; 2) the companies had to be located in geographical proximity: Copenhagen area in Denmark and Brisbane area in Australia. This criterion should control for potential effects of macro-level regional differences such as access to consultants and vendors on individual firm e-commerce adoption. 3) The companies had to be registered SMEs and could belong to different business sectors. Studies on SMEs’ e-commerce adoption focus either on specific sectors or several sectors. Being the objective of the study to investigate adoption and implementation of business-to-business e-commerce in SMEs, it has been assumed that firms belonging to different business sectors would lead to a richer data set than companies belonging to the same sector. The Danish companies were selected with the help of the Danish Chamber of Commerce. To contact and select the sample companies in Australia, assistance was provided by a research assistant at Queensland University of Technology, who in advance had been informed about the objective of the study and the companies’ selection criteria. Due to the companies’ wish the names are kept undisclosed. A summary of the Danish and Australian companies’ characteristics is provided in Table 3 and 4 respectively.

Firm	Business Type	Years in business	Number of employees	International business	Number of PCs	Year of e-commerce adoption	Level of E-commerce Implementation
C1	B-to-B Travel	15	50	Yes	11	1998	Placing and receiving orders (by web)

	Agency						page),advertising, e-banking, sending invoices
C2	Import of Furniture	20	5	Yes	2	2002	Sending images, placing and receiving orders (by e-mail), sending invoices, advertising, e-banking. (Had intent to do these activities through the website)
C3	Institutional Book-Shop	35	18	No	25	1996	Placing and receiving orders (by web page),interactions with customers, paying and receiving payments, advertising.
C4	Marketing Campaigns for other businesses	12	5	Yes (limited)	7	1997	Downloading pictures, sending images, advertising, placing and receiving orders (by e-mail) (Had intent to do these activities through the website)

Table 3. Characteristics of the companies located in Denmark

Firm	Business Type	Years in business	Number of employees	International business	Number of PCs	Year of e-commerce adoption	Level of E-commerce Implementation
F1	Manage sites and facilities for a produce market	40	35	No	15	2000	Searching information, online purchasing of office supplies, market research (Had intent to get to level 3)
F2	Provides Software to companies and institutions in Financial Services	20	140	Yes	160	1996	Level 3: Online customer support, online training, relationship management. Intranet is used for news, HR management, and internal communication.
F3	Provides Consulting Services to SMEs and government	6	3	No	3	1997	Level 3: Marketing, online promotion, offering of trial software from the web site, searching information.
F4	Manufacturing of Illuminating Devices	32	80	Yes (limited)	19	1996	Chasing new customers, sending invoices and purchasing orders

							(by e-mail), online purchasing of office supplies (Had intent to get to level 3).
--	--	--	--	--	--	--	---

Table 4. Characteristics of the companies located in Australia

5. AN ANALYSIS OF SMES E-COMMERCE ADOPTION IN DENMARK AND AUSTRALIA

This section is structured around the environmental, organizational and technological contexts of Tornatzky and Fleischer (1990)'s framework (Fig.1).

5.1 Technological context

In this study perceived e-commerce barriers and benefits and e-commerce related technologies have been found to be significant enablers or inhibitors in the adoption and implementation process. These results mainly corroborate previous research (Scupola, 2003; Iacovou et al., 1995; Kuan and Chau, 2001; Mirchandani and Motwani, 2001). However, this study also finds many significant benefits and barriers not previously discussed in the literature and many similarities and differences between Australian and Danish companies (See Table 5). For example regarding e-commerce barriers Australian companies believed that e-commerce leads to a productivity decrease mainly due to significant factors such as employees using e-mails for their own purposes, too much junk e-mails and e-mail starting to be a mean of constant interruption and distraction (F1, F3, F4).

Denmark	Australia
<u>E-Commerce Barriers:</u> <ul style="list-style-type: none"> • Low employees' IT knowledge (C1, C4); • Lack of understanding of new technology (C1); • Lack of innovativeness of the CEO (C1, C4); • Lack of managerial time (C2); 	<u>E-Commerce Barriers:</u> <ul style="list-style-type: none"> • Productivity decrease (F1, F3, F4); • Cost (F1, F2, F4); • Lack of visible return on investment (F1, F2, F3, F4); • Technology change and evolution (F2); • Customers readiness (F1); • Vendor lock in (F2), • Lack of trust in banks (F3), • Lack of bandwidth outside the capital cities (F3); • Loss of sales due to unreliable service providers (F4); • CEO's lack of IS knowledge (F4).
<u>E-commerce Benefits:</u> <ul style="list-style-type: none"> • Reduction of administrative burden (C1,C2); • Increased efficiency (C1, C2, C4); • Improved communication (C1,C2,C4); • Fast access to information (C1,C4); • Effective advertising (C1); • Increased number of customers (C1,C2); • Improved customer service (C1,C2); • Opening of new offices (C1); 	<u>E-Commerce Benefits:</u> <ul style="list-style-type: none"> • Fast access to information (F1, F2, F3, F4); • Reduction of administrative burden (F1, F2); • First mover advantage (F2); • Contribution to internationalization (F3), • Increased company visibility (F1, F3); • Increased market potential (F4), • Increased collaboration (F3), • Increased public media interest (F1), • Online customer support (F2),

<ul style="list-style-type: none"> • Increased company visibility (C2, C3, C4); • Contribution to Internationalization (C1, C2, C4) 	<ul style="list-style-type: none"> • Online training (F2).
<u>E-Commerce Related Technologies:</u> <ul style="list-style-type: none"> • Digital camera (C1, C2, C4); • Scanner (C2, C4). 	<u>E-Commerce Related Technologies:</u> <ul style="list-style-type: none"> • Push technology (F2); • Videoconferencing (F3); • Video camera connected with PCs (F3) • Internet Security (F3)

Table 5: A summary of significant factors within the technological context in Australia and Denmark

Among the most significant short-time benefits mentioned by Australian and Danish firms were reductions of administrative burden, improvement in communication, easy access to information or products. A significant long-term benefit mentioned by Australian and Danish companies was contribution to internationalization. For example in Denmark e-commerce had given the possibility to C1 to open subsidiaries in other countries.

The study found that availability of e-commerce related technologies can be a significant facilitator or inhibitor of e-commerce adoption and implementation both in Danish and Australian firms. For example, in Australia F2 said that the coming into the market of push technology, giving the possibility of streaming information out to the clients could further enhance their implementation and use of e-commerce. F3 mentioned that Internet- security issues such as theft of identity are still a significant inhibitor in Australia in line with previous research (Amato-McCoy, 2007). In Denmark, C2 and C4 found very convenient using a scanner and a digital camera for taking pictures of products and sending them to the customers by e-mail or uploading them on the web page.

5.2 Organizational context

This study finds that top management support and CEOs characteristics had been the most significant organizational factors in adoption and implementation of e-commerce. In all Danish and Australian companies the decision to adopt e-commerce had been made by top management and CEOs, except in C2, where the idea to adopt e-commerce had generated among the employees due to customers' pressure.

Employees' knowledge and attitude towards e-commerce, whether as inhibitors or facilitators of e-commerce adoption, are also significant both in Australia and Denmark. Previous studies (Thong, 1999; Thong and Yap, 1995) have pointed out that the CEO is generally the single point of authority, usually does not share information with other organization's employees and is the only one with access to the information needed to identify new opportunities. This study finds that CEOs, especially in Australia, are starting taking into considerations the employees' e-commerce suggestions. For example in F2 an employee had taken the initiative to analyze competitors' web sites and as a result top management had decided to change the structure of their own web-site. F1 had hired a girl with extensive e-commerce experience and that had a big impact in F1's decisions regarding e-commerce adoption and implementation. The CEO of F3 stated that he is willing to listen to employees' suggestions regarding e-commerce usage and further implementation. In C2, an employee had suggested the idea to adopt e-commerce to the CEO, who decided to adopt it.

The firm's resource constraints, both human and financial, have been a significant factor in e-commerce adoption and implementation in Denmark and Australia. For example F4 explicitly

say that their CEO has as first priority everything related to manufacturing. Only if there is money in the budget for that year, they can invest it in ICT/e-commerce, even though ICT/e-commerce is very important in support functions such as buying of primary material or selling of finished products. C2 considers lack of human resources significant inhibitors of further e-commerce implementation. Only three Danish firms (C1, C2, and C4) are willing to commit more human and financial resources on further e-commerce implementation based on the realized benefits.

These results strongly support the findings of other studies regarding the most significant organizational factors affecting e-commerce adoption in SMEs: CEO characteristics and top management support, employees' IS knowledge and attitude (Thong, 1999; Mirchandani and Motwani); and resource constraints of the firm (Jeyaraj et al.; 2006; Iacovou et al., 1995). However, this study also finds that CEOs are starting taking into consideration employees' suggestions in their e-commerce adoption and implementation decisions.

5.3 Environmental context

One significant environmental factor influencing adoption and implementation of e-commerce both in Denmark and Australia has been pressure from customers. This study also finds that both in Denmark and Australia the pressure from competitors and suppliers is not very significant. Only one Australian firm (F2) and two Danish firms (C1, C4) said that competitive pressure had been a significant factor in their decision to adopt e-commerce. Access and quality of ICT consulting services had been a significant enabler or inhibitor of adoption and implementation in both countries. The Australian companies, however, had been very dissatisfied with the quality of the service providers. All the four Australian companies had changed service provider several times, and only recently they started being satisfied with the quality of the services provided.

While Danish SMEs found government role non significant, Australian companies perceived government role as a significant factor impacting e-commerce adoption and implementation, but only indirectly. In addition, two Australian companies (F1, F3) believed that becoming the average citizen more informed and more used to e-commerce would also influence the extent of adoption and implementation in small businesses. For example F1 said that they had just hired a high school graduate who had good database and e-commerce skills, acquired mainly as autodidact, and that had influenced the firm's way of using such tools. Two Australian companies (F1, F2) were aware of government initiatives supporting e-commerce pilot projects but they were skeptical about their influence on e-commerce adoption in SMEs. F3 believed that globalization, the open source movement and e-commerce adoption by big corporations were significant enablers of e-commerce adoption in small companies. These results therefore support previous studies regarding customer pressure, access and quality of ICT consulting services (Scupola, 2003) in e-commerce adoption. However these findings are different from previous ones regarding the significance of competitive pressure (Thong; 1999; Zhu et al., 2003) and supplier pressure (Kuan and Chau, 2001). Finally these results also support previous findings regarding the indirect role of government as an enabler of e-commerce adoption through, for example, electronic tendering and e-government (Kuan and Chau, 2001).

6. DISCUSSION OF FINDINGS AND CONCLUSIONS

This study has investigated significant factors affecting SMEs' adoption and implementation of b-to-b e-commerce in Australia and Denmark. The results both corroborate previous findings and provide new, interesting insights. The study also shows many similarities and differences between these two countries. The analysis shows that two environmental factors are significant in e-commerce adoption both in Australia and Denmark: customer pressure and access and quality of ICT consulting services similarly to the results of Scupola (2003) in Southern Italy. Access and quality of ICT consulting services was very satisfactory in both countries, however Australian SMEs had been very dissatisfied with the quality of the service providers, which had been an e-commerce adoption inhibitor in the past. Australian policy programs such as the Building on IT Strengths (BITS) Incubator program, designed to assist small companies in the IT sector, are policy measures that might improve the quality and reliability of the service providers, thus being a policy response to this adoption inhibitor. This study has found that Australian SMEs perceive government as an indirect source of influence through initiatives such e-government, electronic tendering and pilot projects. These results are in line with other findings as for example Kuan and Chau's (2001) study of EDI adoption in Hong Kong. However, Australian firms are still interested in policy leading to immediate tangible benefits such as tax breaks. Finally globalization, the open source movement and adoption by big corporations have emerged as drivers of e-commerce adoption in Australian SMEs. However it is difficult from this study to say whether these factors are peculiar to the ICT consulting industry. Further research is necessary to test this. Regarding the organizational context, the CEOs characteristics and top management support have been found as the most significant factors influencing e-commerce adoption both in Australia and Denmark. Employees' IS knowledge and attitudes and resource constraints have been found important as well, thus mostly supporting previous studies (e.g. Thong, 1999; Mirchandani and Motwani, 2001). In addition this study finds that CEOs and top management are starting taking into consideration employees' suggestions in e-commerce adoption and implementation decisions. Finally, regarding the technological context, the study has found that barriers and benefits are still significant factors in adoption decisions in all Danish and Australian companies. Many policy measures have been undertaken by the Australian and Danish government to decrease barriers and increase awareness of e-commerce benefits (see section 2). These policy initiatives might serve as examples for other countries wanting to improve the level of e-commerce adoption and implementation in SMEs.

Finally this study is not free of limitations. First of all it is difficult to generalize these findings to a larger population of SMEs. Therefore, it is the objective of the author to conduct a statistical survey of SMEs in Brisbane and Copenhagen area. The companies interviewed belong to different business sectors making it difficult to control the variance in size and industry across the two countries. However, being the focus of the study not on a single industrial sector, but broadly on e-commerce adoption factors, the choice of samples in the same industry can be considered as subject for future research. Another limitation of the study is addressing two highly developed countries. It might have been more interesting for example to conduct the study in a developed and an underdeveloped economy. Nevertheless, this study both corroborates previous findings and presents new insights into SMEs business-to-business e-commerce adoption drivers and inhibitors. Therefore it might be of interest to researchers, SMEs owners, practicing managers, and policy makers.

7. REFERENCES

- Al-Qirim, N. (2006), "The role of the government and E-Commerce adoption in small businesses in New Zealand", *International Journal of Internet and Enterprise Management*, Vol. 4, No. 4, pp. 293-313.
- Amato-McCoy, D. (2007) "If It's Safe, They Will Come -- Proactive security measures increase online banking confidence and use, study says". *Bank Systems & Technology*, Vol. 44, Iss. 5; pg. 22
- Benbasat, I., Goldstein, DK., Mead, M. (1987), "The Case Research Strategy in Studies of Information Systems", *MIS Quarterly*, Vol. 11, No. 3, pp. 369-387.
- Chau, P.Y.K., Tam, K.Y. (1997), "Factors Affecting the Adoption of Open Systems: An Exploratory Study," *MIS Quarterly*, Vol. 21, Issue 1, pp.1-24.
- Chong, S. and Bauer, C. (2000). "A model of factor influences on electronic commerce adoption and diffusion in small and medium-sized enterprises." Paper presented at the PACIS 2000: Fourth Pacific Asia Conference on Information Systems, Hong Kong, June 1, 2000
- Dholakia, R.R., Kshetri N. (2004) "Factors impacting the adoption of the Internet among SMEs", *Small Business Economics*, Vol. 23, No. 4.
- Grandon, E., Pearson, J.M. (2003), "Strategic Value and Adoption of Electronic Commerce: An Empirical Study of Chilean Small and Medium Businesses", *Journal of Global Information Technology Management*, Vol. 6, No. 3, 2003.
- Iacovou, C.L., Benbasat, I., Dexter, A.S. (1995), "Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology," *MIS Quarterly*, Vol. 19, Issue 4, pp.465-485.
- Jeyaraj, A., Rottman, J., Lacity, M.J (2006), "A review of the predictors, linkages, and biases in IT innovation adoption research", *Journal of Information Technology*, Vol. 21, Iss. 1, p. 1-23
- Kuan, K., and Chau, P. (2001), "A perception-based model of EDI adoption in small businesses using technology-organization-environment framework", *Information and Management*, 38, pp. 507-521.
- Lertwongsatien and Wongpinunwatana (2003), "E-commerce Adoption in Thailand: An Empirical study of Small and Medium Enterprises (SMEs)", *Journal of Global Information Technology Management*, Vol. 6, No.3, pp. 67-83.
- Miles, M.B., Huberman, A.M. (1994), *Qualitative Data Analysis*, Sage Publications, Second Edition.

- Mirchandani and Motwani (2001), "Understanding Small Business Electronic Commerce Adoption: An Empirical Analysis". *Journal of Computer Information Systems*, Spring, 70-73.
- OECD (2000), "OECD Small and Medium Size Enterprise Outlook " (<http://www.oecd.org>) (Accessed the 15th of August 2006).
- OECD (2002), "OECD Small and medium Size Enterprise Outlook " (<http://www.oecd.org>) (Accessed the 15th of August 2006).
- Papazafeiropoulou (2004), "Inter-Country Analysis of Electronic Commerce Adoption in South Eastern Europe: Policy Recommendations for the Region", *Journal of Global Information Technology Management*, Vol. 7, No. 2, 2004.
- Premkumar, G. (2003), "A Meta-Analysis of Research on Information Technology Implementation in Small Business". *Journal of Organizational Computing and Electronic Commerce*, 13 (2): 91-121.
- Rai, A. and Howard, G.S. (1994), "Propagating CASE usage for software development: An empirical investigation of key organizational correlates", *OMEGA*, Vol. 22, No. 2, pp. 21-34.
- Ramdani, B. and Kawalek, P. (2007). SME Adoption of Enterprise Systems in the Northwest of England: An Environmental, Technological and Organizational Perspective. *IFIP - The International Federation for Information Processing, Volume 235, Organizational Dynamics of Technology-Based Innovation: Diversifying the Research Agenda*. Boston. 409-430.
- Rogers, E.M., (1995), *The Diffusion of Innovations*, 4th edition. Free Press, New York.
- Sabherwal, R., Jeyaraj, A., Chowa, C. (2006) "Information System Success: Individual and Organizational Determinants", *Management Science*, Vol. 52, Iss. 12, p. 1849-1864 (16 pp.)
- Scupola, A. (2003), "The Adoption of Internet Commerce by SMEs in the South of Italy: An Environmental, Technological and Organizational Perspective," *Journal of Global Information Technology Management*, Vol. 6, No.1, pp. 51-71.
- Scupola, A. (2005), "Government Intervention in SMEs' E-Commerce Adoption", in Al-Quirim, N. (ed.) *Global Electronic Business Research: Contemporary Issues, Implications and Future Trends*, IDEA Group Publishing, USA.
- Taylor, S. and Todd, P. (1995), "Understanding Information Technology Usage: A test of competing Models", *Information Systems Research*, Vol. 6, No. 2, pp. 144-176.
- Thong, J.Y.L. (1999), "An integrated model of information systems adoption in small business," *Journal of Management Information Systems*, Vol.15, Issue 4, pp. 187-214.

Thong, J. and Yap, C. , (1995), “CEO Characteristics, organizational characteristics and information technology adoption in small business”, Omega, International Journal of Management Sciences, Vol. 23, No.4, pp. 429-442.

Tornatzky, L. G., Fleischer, M. (1990), The Processes of Technological Innovation, Lexington Books

Zhu, K., Kraemer, K., Xu, S. (2003), “Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors”, European Journal of Information Systems, Vol. 12, Iss.4, pp. 251-268.

Zwass, V. (1997), Foundations of Information Systems, New York, McGraw-Hill.

Yin, R.K., (1994), Case Study Research Design and Methods, Second Edition, Vol. 5, Sage Publications.

www.business.gov.au (accessed the 10th of August 2006)

www.asb.gov.au (accessed the 10th of August 2006)