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Adoption of E-Commerce in Small and Medium Size Enterprises in Australia

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ABSTRACT

This paper presents the preliminary results of a study on adoption of e-commerce in Australian small and medium enterprises. Tornatsky and Fleischer (1990) model is used, therefore the main group of factors taken into consideration are environmental, organizational and technological. Five case companies located in the area of Brisbane, Queensland have been interviewed. The preliminary results are partially in line with similar studies on e-commerce adoption. However many differences are also found. For example this study found that the external environment has an influence mainly through customers’ requirements and pressure and availability of IT services, contrary to other studies that found that government and public administration have a big role. The organizational and technological contexts have also much relevance and include factors such as employees and CEO attitude. The factor cost did not have much importance in the initial adoption stage, but it might be more important in the future.

KEY WORDS
Adoption, implementation, Internet, e-commerce, SMEs

INTRODUCTION

Small and medium size enterprises (SMEs) are an important sector of the economy and in some countries constitute more than 90% of businesses (OECD, 2002). SMES management issues, problems and opportunities are very different from those of large corporations, therefore the need to focus specifically on this segment. In this paper the European Parliament definition is adopted according to which SMEs are businesses with up to 250 employees (OECD, 2002) and e-commerce is defined as “the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks” (Zwas, 1996). This article focuses on business-to-business and business-to-consumer Internet-commerce, here called just e-commerce. Previous studies on adoption of information technology and e-commerce by small businesses have primarily focused on use, user satisfaction, and success factors (e.g. Walczuch, Van Braven, Lundgren, 2000).

The purpose of this article is to present the results of a study on adoption and implementation of e-commerce in SMEs in Australia. This country is interesting because is considered to be very advanced in e-commerce adoption (OECD, 2002). Other studies have been conducted on e-commerce adoption in this country. For example, Marshall, Sor, McKay (2000) and Akkeren and Cavaye (2000) investigate e-commerce impacts in the automobile industry. Poon and Swatman (1999) and Poon (2000) investigate e-commerce adoption issues in small businesses including benefits, barriers and the impact of the business environment on the decision to adopt. This study, discussing the partial preliminary results of a comparative study of e-commerce adoption between Australia and Denmark, distinguishes itself from previous literature because it only focuses on the organizational, technological and environmental factors and it looks both at adoption and implementation of e-commerce in Australia. Furthermore this study only takes into consideration companies that have already adopted e-commerce. The basic research question is:”What are the factors affecting the adoption and implementation of e-commerce in Australian small businesses?” The study can be of interest to academics and managers interested in understanding the problems faced by small businesses in adopting e-commerce as a major business channel.

The article is structured as follows. The first section is the introduction. The second section presents a short literature review of small business IT adoption frameworks. The third section describes the research design and the data collection process, while a description of the companies is given in the fourth section. The following section analyses the results, while the final section presents a discussion of findings, conclusions and implications for further research.
FACTORS AFFECTING IT ADOPTION: A LITERATURE REVIEW

A fundamental approach to studying the adoption of new technologies is the diffusion of innovations (Rogers, 1995). Many studies have investigated explanatory variables for inter-organizational systems (IOS), IS and IT adoption and satisfaction both in small and large organizations (e.g. Chau & Tam, 1997; Kurnia & Johnston 2000; Premkumar & Ramamurthy 1995). Five main studies focusing on SMEs are summarized here as illustrated in Table 1.

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>STUDY OBJECT</th>
<th>Type of Company</th>
<th>EXPLANATORY VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scupola (2003)</td>
<td>Internet-based e-commerce</td>
<td>SMEs</td>
<td>Organizational Characteristics (Innovation champion, Employees knowledge)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Environmental Characteristics (competitive pressure, customer/supplier pressure, government and public administration, quality of access to e-commerce related services)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Technological Context (E-Commerce barriers, benefits; e-commerce related technologies)</td>
</tr>
<tr>
<td>Thong (1999)</td>
<td>IS</td>
<td>SMEs</td>
<td>- CEO Characteristics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Perception of IS Attributes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Organizational Characteristics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Environmental Characteristics (only competitive pressure)</td>
</tr>
<tr>
<td>Iacovou et al. (1995)</td>
<td>EDI</td>
<td>SMEs</td>
<td>- Perceived Benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Organizational Readiness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- External Pressure</td>
</tr>
<tr>
<td>Palvia &amp; Palvia (1999)</td>
<td>IT</td>
<td>SMEs</td>
<td>- Business Related Factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Owner Related Factors</td>
</tr>
<tr>
<td>Kuan and Chau (2001)</td>
<td>EDI</td>
<td>SMEs</td>
<td>- Organizational Characteristics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Environmental Characteristics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Technological Characteristics</td>
</tr>
</tbody>
</table>

Table 1. Summary of Studies of SMEs IT adoption

Iacovou, Benbasat and Dexter (1995) identified three major factors responsible for EDI adoption: 1) organizational readiness, operationalized as financial and technological resources of the firm; 2) external pressures divided into competitive pressure and imposition by trading partners and 3) technology perceived benefits. By investigating seven case studies of small businesses, Iacovou concluded that small organizations tend to lack the needed high organizational readiness and a major reason for SMEs to adopt EDI is external pressure by trading partners.

Thong (1999) developed and tested a model including CEO, IS, organizational and environmental characteristics as explanatory variables for IS adoption. The main difference between Thong’s model and other models is that CEO characteristics are a variable per se, while in most other frameworks they fall under organizational characteristics. The results show that CEO characteristics have a major importance in IS adoption.

Palvia and Palvia (1999) focused on businesses with very few employees and conducted a study to “develop a new measure and instrument for small business user satisfaction with information technology, and also to measure and report satisfaction
among small-business users” (Palvia and Palvia, 1999, p. 128). They found that IT satisfaction is influenced by business-related factors and by owner characteristics. The results show that owner characteristics have a greater impact on IT satisfaction, while training, education, software maintenance, documentation and vendor support are some of the reasons for dissatisfaction.

Kuan and Chau (2001) conducted a study in Hong Kong to understand factors distinguishing SMEs that are EDI adopters from non adopters. They propose a perception–based small business EDI adoption model based on Tornatzky and Fleischer’s (1990) framework and Iacovou (1995)’s study and test it with a survey. The main results can be summarized as follows: perceived direct benefits were distinguishing adopters from non adopters, while perceived indirect benefits were not a distinguishing factor. Perceived financial cost and perceived technical competence was more an obstacle for non adopters then adopter firms. Finally adopter firms perceive a higher government pressure and a lower industry pressure then non adopters do.

Scupola (2003) tailored Tornatzky and Fleischer’s (1990) framework to the specific context of SMEs e-commerce adoption as illustrated in Fig. 1. This framework has three main explanatory variables for technology adoption: the external environmental context, the organizational context and the technological context. External environmental context contains factors such as pressure from competitors, customer-supplier relations, and access to suppliers of technology-related services and government involvement. The organizational context contains factors such as financial and technological resources of the firm, employees’ IT knowledge and attitude, innovation champion and firm size. The technological context represents the pool of technologies available for adoption (Scupola, 2003, p. 57). Adoption of technology is related to its attributes as perceived by potential adopters (Rogers, 1995). Relative advantage (e.g. perceived barriers and benefits), compatibility (both technical and organizational) and trialability (e.g. pilot tests) are distinguished as the main Internet attributes. Scupola (2003) also claims that Internet related technologies play an important role in e-commerce adoption, factor that had not been taken into consideration in previous studies. The conclusions of Scupola (2003) study are that government intervention, public administration and external pressure from customers, suppliers and competitors are very important in a small company decisions to adopt e-commerce. The characteristics of the two other contexts, organizational and technological, are necessary but not sufficient.

**Figure 1. A Model of Internet Commerce Adoption in SMEs (Scupola, 2003; Adapted from Tornatsky and Fleischer, 1990)**

**External Environment:**
- Pressure from Competitors, Buyers and Suppliers,
- Role of Government,
- Technology Support Infrastructure

**Organizational Context:**
- Financial and Technological Resources
- Employees’ IS Knowledge
- Innovation Champion
- Company Size

**Technological Context:**
- E-Commerce Barriers,
- E-Commerce Benefits
- Technologies

**RESEARCH APPROACH AND DATA COLLECTION**

To investigate the research question a multiple case study approach (Yin, 1994) was used. To ensure that the companies chosen were subject to the same external factors, geographical proximity was defined as one criterion for selection. Also being interested in adoption and implementation of e-commerce as defined in the introduction, another major selection...
criterion was that firms had to have at least an Internet connection and were using e-mail. The companies participating in this study were chosen across different business sectors. To select the sample of companies, assistance was provided by a research assistant at Queensland University of Technology. Five companies in Brisbane area have been selected. They varied in regards to ownership, size and age. Due to the commercial confidentiality, names of the companies are kept undisclosed.

Face-to-face semi-structured interviews based on an open-ended questionnaire were used to collect the data. The interviews were conducted with CEO, managers and other employees that had been involved in the adoption and implementation of e-commerce. The companies had suggested the person to interview based on the questionnaire that the author had sent them prior to the interview. The face-to-face interviews were conducted within a six-week period during summer 2003 by the author at the company location. Only one person was interviewed at each company. Triangulation has been achieved by, in addition to each interview, visiting and analyzing the web site of each respondent prior to the interview and after the interview. The questionnaire was divided into two parts. Part one captured the background information about the respondents’ gender, age, educational level, years with the organization as well as information about the firm concerning Internet adoption, examples of Internet activities, web page sophistication. In part two the questions focused on gaining information about factors affecting adoption and implementation of e-commerce with regard to the three contexts of the Tornatzky and Fleischer model, adapted by Scupola (2003) to SMEs e-commerce adoption.

Each interview lasted for about 1 hour. All interviews were tape-recorded and transcribed. Notes were also taken during the interviews. Each interview was transcribed in a sequential order to ensure reliability of the data (Perakyla, 1997). The total data collected in the five different cases were analyzed intuitively by the author according to the three contexts of Tornatzky and Fleischer (1990) framework adapted by Scupola (2003) to e-commerce. The parts of the text relevant to each context were then contextualized according to the specific subcategories of Scupola’s (2003) framework (Creswell, 1998; Walcott, 1994). The data from the interviews were supplemented with data and information available on the web site. The results of the study were sent to the companies interviewed to ensure validity (Creswell, 1998).

COMPANIES’ BACKGROUND

The age of the five firms ranged from 6 to 40 years. Firms’ size varies from 2 to 140 employees. Two out of the five firms (F2 and F4) conduct international business. The firms had a wide range of experience with Internet commerce adoption. Two companies had adopted Internet within the last six years, three within the last three years. Only one company does not have a web page yet. The degree of sophistication of the web pages varies from a static web page (F1, F4) to a web page offering the capability to download software components (F3) or offering online training and online customer support (F2). However, none of the companies has an online catalog. Only F2 has an Intranet which they believe to be quite a useful tool for internal communication and management. A summary of the companies’ characteristics can be found in Table 2.

F1 is in the business of site and facilities management, has existed since 1964, and has been privatized 2 years ago. The company has 35 employees, 15 PCs interconnected with a LAN and started using e-commerce in year 2000. Internet is mainly used as a resource of information and market research. F1 has a basic web site and does not offer further web-functionalities mainly because they are unsure about their tenants’ interest into this technology.

F2 is a financial service software provider, established in 1983. F2 has three subsidiaries in Australia and serves the Australian and the New Zealand markets. The company has 140 employees. It has a call center and circa 160-180 PCS and servers connected in a LAN and WAN. Their use of e-commerce is limited to e-mail and to a corporate web site providing information for prospective clients. They also have an online customer support and offer online training. Mainly based on their own clients’ experience, they have decided not to do very much about their own web site.

F3 is in software development. The clients are SMEs, larger size companies and government departments. They serve the local market. The company employees 3 people: the CIO, 1 full time and 1 part time employee. They have an Internet connection and a web page which is mainly used for communication, marketing and promotion purposes. It is possible to download some software components from the web side for trial by the clients, without charge. They have been having a web page since the company was started in 1997.

F4 was established in 1971 and serves the national and international market. F4 has 80 employees and manufacturers point of sale objects such as displays and illuminated signs. They have adopted e-commerce in 1996. They have 19 PCs interconnected by a LAN. Their customers are international corporations. They use Internet for e-mail, sourcing material and chasing new customers. They also buy office supplies from online catalogs.

F5 is a private practice in Human Resource Management, specializing on generic and workplace situations counseling. The customers are single individuals, government agencies, and private services. The company has existed for the last 15 years.
<table>
<thead>
<tr>
<th>Firm</th>
<th>Business Type</th>
<th>Years in Business</th>
<th>Number of employees</th>
<th>International business</th>
<th>Number of PCs</th>
<th>Year of e-commerce adoption</th>
<th>Internet use</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Site and facilities Management</td>
<td>40</td>
<td>35</td>
<td>No</td>
<td>15</td>
<td>2000</td>
<td>Communication, searching information, online purchasing of office supplies, market research</td>
</tr>
<tr>
<td>F2</td>
<td>Financial Service Software Provider</td>
<td>20</td>
<td>140</td>
<td>Yes</td>
<td>160</td>
<td>1996</td>
<td>Communication, online customer support, online training, relationship management. Intranet is used for news, HR management, and internal communication.</td>
</tr>
<tr>
<td>F3</td>
<td>Software Development</td>
<td>6</td>
<td>3</td>
<td>No</td>
<td>3</td>
<td>1997</td>
<td>Communication, marketing, online promotion, offering of trial software from the web site, searching information.</td>
</tr>
<tr>
<td>F4</td>
<td>Manufacturing</td>
<td>32</td>
<td>80</td>
<td>Yes (limited)</td>
<td>19</td>
<td>1996</td>
<td>Communication, information retrieval, chasing new customers, sending invoices and purchasing orders, online purchasing of office supplies.</td>
</tr>
</tbody>
</table>

Table 2. Characteristics of sample companies

There are two employees, the owner and a secretary. F5 serves the local and regional market as subcontractor for the government. F5 uses Internet for e-mail, information retrieval and e-banking. F5 does not have a web site yet mainly because of costs and lack of time. It has used an online catalog provided by a third party to advertise his business, but it has not generated much business. He is mainly relying on word of mouth to generate new business.

ANALYSIS

This section is structured around the three main contexts of the model of Fig. 1: environmental, organizational and technological context. The factors affecting each one of these contexts are summarized in Table 2, Table 3 and Table 4 respectively.
## Environmental context

<table>
<thead>
<tr>
<th>The contexts of Tornatsky and Fleischer (1990) model adapted by Scupola (2003)</th>
<th>Factors found in the study in relation to each context</th>
</tr>
</thead>
</table>
| **External Environmental Context** | Government: indirect force of influence (F3, F5). No influence (F1, F2, F4)  
Public Administration: secondary source of influence (F5, F1); No Influence (F2, F3, F4).  
Big Corporations: could influence by being early adopters (C3)  
Trade Associations: indirect influence by providing information about present and future (F1, F3); No influence (F2, F5, F4)  
External Pressure: customers (F2, F3, F4, F5); suppliers (F5); competitors (F2)  
Quality of Access to e-commerce related services: problems with service providers (F1, F3, F4, F5).  
Globalization (F3)  
Open Source Movement (F3) |
| **Organizational Context** | Marketing department (F2)  
Employees knowledge and interest (F2, F3); CEO (F2, F1, F3, F4)  
Financial Resources ((F2, F1, F3, F4) |
| **Technological Context** | E-Commerce Barriers: reduction of employees productivity (F1, F4); constant interruption and distraction (F1,F3); too much junk mails (C1, C3); lack of competence, knowledge (F1, F5); cost (F1, F2, F4, F5); lack of visible return on investment (F1, F2, F3, F4, F5); technology change and evolution (F2); customers technological readiness (F1); lack of awareness of the technology from a technological point of view (F1); lack of time (F5); lack of training (F5); fear of getting lost in cyberspace (F 5); vendor lock in (F2), fear of theft of identity (F3), lack of trust in banks supporting electronic transactions (F3), lack of bandwidth and infrastructure outside the capital cities (F3); loss of sales due to unreliable service providers (F4); CEO’ lack of knowledge (F4, F5).  
E-Commerce Benefits: fast access to information (F1, F5, F2, F3, F4); reduction of administrative burden (F1, F2); first mover advantage (F2); contribution to internationalization (F5, F3), increased company visibility (F1, F3); increased efficiency (F1, F4), increased market potential (F5, F4), decreased costs (F2, F4)); increased collaboration (F5, F3), increased sales (F4), increased public media interest in the company (F1), online customer support function (F2), online training (F2).  
E-Commerce Related Technologies: push technology to stream information to clients (F2); videoconferencing (F3); video camera connected with PCs (F3) |

Table 3. Factors affecting adoption of e-commerce
As it can be seen from Tables 3 and 4 the main external factors influencing adoption and implementation of e-commerce have been pressure from customers also found by Iacovou (1995) and Scupola (2003) and quality of IT services. In fact 4 out of 5 companies believe these factors had a big influence. This supports the inclusion of customer pressure as an important factor in the model. Regarding the quality of IT services, small companies were generally satisfied with the consulting services, while very dissatisfied with the quality of the service providers. All the sample companies had changed the service provider several times, and only recently they started feeling satisfied with the level of service provided.

Competition, supplier pressure, and influence of government, public administration and trade association are negligible factors. The companies believe that government, public administration and trade associations were providing some information, organizing seminars, etc., but they were mostly directed to the single citizen and mom and pop stores rather than corporations. However, they all believed that becoming the single citizen more informed and more used to e-commerce would influence the extent of adoption also in small companies. None of the companies were aware of direct government intervention such as tax breaks, pilot projects, and financial incentives. F3 believed that globalization, open source movement and adoption of e-commerce by big corporations could affect e-commerce adoption in small companies, at least in the software sector.

**Organizational context**

The sample companies had recognized the relative advantage of e-commerce and allocated the required financial resources to it, however the companies had expressed concern about further investing in e-commerce, especially due to uncertainty of the return on investment (F1, F2, F3, F4, F5). Therefore financial constraints and uncertainty of return on investment are still important factors influencing adoption of e-commerce in SMEs (e.g. Iacovou et al., 1995).

### Table 4. Environmental context factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive Pressure</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Customers’ Pressure</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Suppliers’ Pressure</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>IT services</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Government</td>
<td>No</td>
<td>No</td>
<td>Yes(Indirectly)</td>
<td>No</td>
<td>Yes(Indirectly)</td>
</tr>
<tr>
<td>Public Administration</td>
<td>Yes(Indirectly)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes(Indirectly)</td>
</tr>
<tr>
<td>Trade Associations</td>
<td>Yes(Indirectly)</td>
<td>No</td>
<td>Yes(Indirectly)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Globalization/Open Source Movement</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Big Corporations as Driving Force</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### Table 5. Organizational context factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial resources</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Employees’ IT knowledge/attitude</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>CEO’s characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Other factors</td>
<td>Marketing Department</td>
<td>EDB Department (Only recently)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Employees’ IT knowledge, expertise and attitude are important only in three companies (see Table 5), but they have importance on the way e-commerce is used only once it has been adopted. The decision to adopt and extent of implementation is still made by upper management and CEO (F1, F2, F3, F4, F5), thus supporting the results found in other studies (e.g. Poon and Swatman, 1999; Thong 1999). However, recently CEOs are starting taking into considerations employees’ suggestions (F1, F2, F3). For example in F2 the marketing department is responsible for the web page and gives suggestions to upper management. Employees can give suggestions as well. For example F2 had an employee that started looking at competitors’ web sites and found out that they were more people oriented than theirs, so they decided to change their own web site. Also the CEO of F3 stated that he is willing to listen to employees suggestions regarding e-commerce usage and expansion. The EDB department is starting having an important role in e-commerce adoption in F4. The decision to adopt is often based on financial constraints, uncertainty of return on investment, and on the knowledge of the upper management and CEO about the benefits of the technology. Lack of managerial time was the reason for late adoption in F5.

Technological context

In this study the technological context factors have been grouped into three main categories according to the model of fig. 1: e-commerce barriers, e-commerce benefits and e-commerce related technologies. All five companies have pointed to financial constraints and lack of visible return on investment as major barriers to e-commerce adoption and further implementation. Some companies believe that e-commerce leads to a productivity increase (F2), others (F1, F3) instead pointed out to a productivity decrease mainly due the employees using e-mails for their own purposes instead of telephone, the amount of junk mail and e-mail being a factor for constant interruption and distraction. Other factors emerged as potential barriers are vendor lock-in and threat of disintermediation (F2). Furthermore F3 pointed to a lack of trust in the banks’ support for electronic transactions, since the customer is not protected if anything goes wrong, and the fear of theft of identity. F4 considered loss of sales due to unreliability of the service providers as an inhibitor to further use e-commerce. Adoption and implementation cost was still considered an important issue by all the companies, except F3.

All firms in the sample identified a number of short- and long term e-commerce benefits mostly similar to those already mentioned in the literature (E.g. Scupola, 2003 provides an extensive review). A new short-term benefit was increased public media interest in the company (F1). The most important long term benefit was improvement of customers relations and communications (F2, F3, F4, F5), increased market potential (F5, F4), contribution to internationalization (F5, F3). F2 also mentioned the possibility of offering online training and online customer support. The study also found that complementary technologies could be important facilitators of e-commerce adoption in line with Scupola (2003). For example, F2 said that the coming of push technology, giving the possibility of streaming information out to the clients could increase their use of e-commerce. F3 said that more widespread and cheaper use of videoconferencing and video camera connected to PCs could further adoption of e-commerce. The study provided thus strong support for including real and perceived benefits and barriers, and Internet related technologies as factors in the model of Fig. 1.

DISCUSSION OF FINDINGS AND CONCLUSIONS

This study has investigated factors affecting adoption and implementation of e-commerce in small- and medium-sized enterprises in Australia. The study found that two external factors have a major importance in adoption of e-commerce: customer pressure and quality of IT services. Marshall et al. (2000) and Akkeren and Caveye (2000) also found industry-related factors as being important, but they were identified mainly in competitors and suppliers pressure. Contrary to the studies by Scupola (2003) and Kuan and Chau (2001), this study has found that the influence of government, public administration and trade associations is inexisten or at least very limited to an indirect source of influence, while industry pressure is important at least in terms of customers. As far as the companies interviewed know there are no financial governmental incentives directly or indirectly targeting adoption of e-commerce in SMEs. Some informational campaigns have been conducted by the government and trade associations have organized seminars (F1), but they did not have a big influence. What could make a difference is financial incentives (F1, F2, F3, F4, F5) as also found by Scupola (2003). However, F3 said that the government could have an influence by offering electronic tendering as found by Kuan and Chau (2001). Furthermore, the companies interviewed (F1, F3, F4) perceive that governmental campaigns are mostly directed towards the single citizen, thus having only an indirect spill over effect into the local business community.

Regarding access to IT related services, the study concludes that consulting services are satisfying in the area (F1, F4, F5), however the quality of the Internet service providers is not very good (F1, F2, F3, F4, F5). Only recently this is getting better.
This is different from the Marshall et al. (2000) results that found most dealers used an ad hoc approach to their web sites and were reluctant to use consultants.

Finally two factors have emerged that had not been discussed in earlier literature: the importance of globalization and the open source movement (F3). However it is difficult from this study to say whether these factors are peculiar to the software industry. Further research is necessary to test this. It can be concluded therefore that the results of this study only partially support the external environment context of the model of Scupola (2003), with customers’ influence and quality of access to IT services being the most relevant factors affecting e-commerce adoption.

Regarding the organizational context, the CEOs characteristics appear as the most important factor. The CEO’s decision is based on the perception of return on investment, the financial resources of the firm and the perceived benefits of e-commerce. For example F4 specifically mentions that they first prioritize investments in manufacturing and then in IT.

Employees’ interest and attitude is also considered important both for adoption and extent of implementation. For example the CEO of F3 said that if one of his employees goes to him and says that he would like to buy an application to do so and so, then he would normally give the permission to buy. F2 said instead that the marketing department had a major role in suggesting to the CEO what to do, while F4 said that recently the CEO is also opening up to the suggestions from the EDB department. So we can conclude that also this study supports the model of fig. 1 regarding the organizational context and is in line with other studies on IT adoption, further confirming that CEO characteristics are determinant in adoption (e.g. Palvia and Palvia, 1999; Thong, 1999). This study also shows that CEOs are more and more basing his decisions on inputs from company employees or external consultants. However the CEO characteristics had not been an issue in Kuan and Chau (2001) study.

Regarding the technological context, the study has found full support for the categories of e-commerce benefits, barriers and Internet-related technologies. New benefits mentioned are online customer support, online training, and increased public media interest in the company (F1). New barriers mentioned are reduction of employee productivity; constant interruption and distraction; too much junk mails; vendor lock-in and threat of disintermediation. Cost is still an important factor inhibiting adoption in Australia.

To conclude the study supports only partially the variables of the external environment of Scupola (2003) model, while full support is almost found for the variables of the organizational and technological contexts.

Finally the study presents a number of limitations. For example, the sample was collected only in the area of Brisbane. In order to generalize from these results to the whole Australia, the study needs to be replicated in other settings. Nevertheless, this research gives some insights into SMEs e-commerce adoption issues in Australia that can be of interest to researchers, SMEs owners, practicing managers and those seeking to adopt e-commerce.

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