SME barriers to elctronic commerce adoption

nothing changes - everyting is new

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Chapter XI

SME Barriers to Electronic Commerce Adoption: Nothing Changes– Everything is New

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ABSTRACT

In this chapter we look into earlier empirical research on the barriers to e-commerce (EC) adoption and diffusion for small and medium-sized enterprises (SMEs). We explore research conducted in the context of information and communications technologies (ICT) in general, as well as EDI and Internet-based e-commerce. What we are interested in is whether these barriers are something new created by the new wave of Internet based technologies. We divide the barriers, inhibitors, or factors slowing down the diffusion of new

technologies found in previous literature into those internal to an organization and those imposed by external forces. The basic premise of this chapter is that technologies advance or change, but the barriers for SMEs to adopt them do not. The authors hope that understanding this will help researchers, small companies, and policy makers to move on and do something active to reduce such barriers.

INTRODUCTION

As a majority of the large businesses now have entered the "new information society," the small and medium-sized enterprises are expected to be next in turn. SMEs have undoubtedly an important role in most economies and are fundamental, especially in less developed countries and peripheral European regions. For example, in UK SMEs represent over 95% of all businesses registered for VAT, employ 65% of the work force, and produce 25% of gross domestic product (Ballantine, Levy, and Powell, 1998). SMEs play a key role in the economy by generating employment, engendering competition, and creating economic wealth (Hay and Kamshad, 1994). They are also fundamental in promoting new innovations (ibid.) and providing society with new products (Walczuch, van Braven, and Lundgren, 2000). At the same time SMEs are characterized by a high degree of failures (Ballantine et al., 1998). Within five years 80 % of all new small businesses have failed (ibid.). Because of their importance, small businesses need to be embraced in the new information society as the Internet in the long run might affect their productivity, market access, and competitiveness (Walczuch et al., 2000). To be able to survive and prosper SMEs need to keep up with their larger counterpartners' way of doing business.

In recent years one of the most apparent trends in business is e-commerce. Even if the growth in e-commerce still has not been able to fulfil the optimistic prognosis, it is certainly here to stay. E-commerce in SMEs has become an important subject both in policy formulation and in research. For example, OECD (1998) believes that the adoption and diffusion of e-commerce among SMEs could contribute to increasing substantially their competitive advantage. Often e-commerce or electronic business is seen almost as the latest "miracle cure" for SMEs. Various national and regional (e.g., EU) projects on "SME awareness" to facilitate SME involvement in e-commerce are becoming more and more common on national and regional political agendas. Research studies on this subject are increasing as well (e.g., Chen and Williams, 1998).

It is feared, however, that because of a number of barriers and inhibitors, SMEs are left out of the developments in the information society. The high capital

investment involved in IT adoption and the need of skilled manpower make the barriers larger for SMEs than for larger businesses (Thong, 2001). According to OECD (1998), the most significant barriers of e-commerce for SMEs in the OECD countries are lack of awareness, uncertainty about the benefits of e-commerce, concerns about lack of human resources and skills, set-up costs and pricing issues, and concerns about security.

The development of the Internet has opened up e-commerce between businesses (B2B) as well as between businesses and consumers (B2C). The big difference from earlier communication methods is the wide availability and low cost of the technology. Start-up costs and transaction costs are far lower than before, and an increasing part of companies and consumers are using the Internet to conduct their business. Still the small and medium-sized companies are hesitating.

In this chapter we look into earlier empirical research on the barriers to e-commerce for SMEs. What we are interested in is whether these barriers are something new created by the new wave of Internet-based technologies. Our grounding argument is that these barriers have remained the same since SMEs got involved in IS/IT and are not particularly specific to the new Internet-based technologies. We look at adoption and diffusion barriers of different information technologies in SMEs, with the focus on information and communications as well as e-commerce technologies, including different inter-organizational systems (IOS), EDI, and Internet-based solutions.

The chapter is structured as follows. In the following section we present definitions of e-commerce and SMEs and argue for the importance of looking at e-commerce adoption barriers among SMEs. The section "What's In It?" briefly touches upon the reasons why SMEs might benefit from e-commerce, and therefore the necessity to look at the reasons why e-commerce is still not spreading. The section "Barriers to E-Commerce" discusses barriers of Internet-based e-commerce adoption found in previous literature, as well as relating and comparing them, where it is possible, with SMEs' adoption barriers of EDI and IS/ICT in general. Finally, the last section summarizes the findings of the chapter and gives some suggestions for further research.

E-COMMERCE AND SME

Much confusion surrounds the definition of e-commerce. Some see e-commerce as Internet-based activities only, while others include any kind of business or exchange of information on any type of network. Our approach is closer to the latter one: we define e-commerce as a process, where electronic connections

facilitate economic transactions between various parties in the value chain. This wide definition includes the usage of different types of information and communication technologies and systems, trade in both physical and digital products, and different types of services (Tuunainen, 1999). Even though this definition of e-commerce includes a range of technologies from proprietary IOS and EDI to Internet-based solutions and mobile or wireless technologies, for the purposes of this study we distinguish between the different technologies when such has been done in the reviewed literature.

There are different definitions of what SMEs are. The number of employees and turnover are two factors used to categorize businesses. According to the European Parliament, SMEs are businesses with up to 500 employees, net fixed assets of less than ECU 75 million, and with no more than one-third of their capital in the hands of a larger company. The European Parliament divides SMEs into different sub-groups based on the number of employees, for instance small undertakings with 10 to 50 employees and medium-sized undertakings with 50 to 250 employees (European Parliament, 2000).

A long-debated issue is whether SMEs substantially differ from larger ones or not. SMEs are not homogeneous and some even claim that it is impossible to draw any general conclusions about them. Still company size has been found to be a critical factor to adoption of e-commerce technologies (Premkumar, Ramamurthy, and Crum, 1997; Premkumar and Roberts, 1999). There also seems to be a significant difference in use of e-commerce between large and small companies. A Swedish study shows that 87.5% of companies with more than 500 employees had their own Web site in 1999. The corresponding figure for companies with 10-19 employees was 48.2% (Jönsson, 2001). The difference is even more substantial when looking at EDI adoption. While more than 62% of the largest companies have adopted EDI, only 7% of the micro companies (10-19 employees) have EDI (ibid.). This is problematic for the small companies that may be able to save money and increase revenue with the help of e-commerce technologies. The poor spreading to small companies, however, also cripples their larger business partners' possibility to gain optimal advantages from their e-commerce investments. Once a company has implemented any form of e-commerce, it is a large advantage to be able to connect all of its partners to the new system. In that way they avoid working with double routines and can reach maximal benefits.

Most companies today live under a strong economical, as well as technological, pressure. Welsh and White (1981) describe this special condition that distinguishes SMEs from their larger counterparts as "resource poverty." The increased globalization has intensified competition, the technical development is

fast, and the information overload puts new demands on organizations (Turban, Lee, King, and Chung, 2000). For small businesses to strengthen their competitive ability and face the increased competition, both nationally and internationally, they need to adopt new technologies for production as well as management of the company (Julien, 1995). Some even claim that SMEs in the long run will be the real beneficiaries of IT (Chesher and Kaura, 1999).

A lot has been written about SMEs' poor ability to use IT as a strategic resource. For example, SMEs lack both business and IS/IT strategy, they have limited information skills, and when they modernize their equipment, the planning process is less structured and more incremental than in larger businesses (Ballentine et al., 1998; Julien, 1995). The strategic decision-making process is short-termed and reactive rather then proactive (Blili and Raymond, 1993). SMEs often use intuitive methods when monitoring new technologies and collect information in a more iterative and less organized manner (Julien, 1995). In small businesses the CEO is often the same person who owns the company. This makes his or her vision and commitment essential, especially to get the adequate resources and support to implement an innovation (Premkumar and Roberts, 1999).

The perhaps mostly discussed difference between SMEs and large businesses is the resource constraints that the former have to deal with. SMEs are usually poor in human, as well as financial, resources (Blili and Raymond, 1993). Their weak financial standing makes them more vulnerable to risk-taking, and an innovation (such as e-commerce) can represent a disproportionately large financial risk (Rothwell and Dodgson, 1991). Also, the level of IT-knowledge is generally low in SMEs. Small businesses often have difficulties recruiting and keeping well-trained IT personnel and their financial standing prevents them from employing their own IT expertise (Thong, 2001). Even though there is often a general lack of IS expertise in SMEs, small companies are unfortunately also less inclined to use external advice-giving services (Thong, Yap, and Raman, 1996).

There are also some advantages with being small. Small companies are claimed to be more flexible and they can more rapidly adapt to new demands and changes in the external environment (Rothwell and Dodgson, 1991). This is facilitated by an efficient internal communication that takes place in informal networks (Rothwell and Dodgson, 1991). The ability to reorganize fast is a valuable property, since a high level of uncertainty usually characterizes the environment of smaller businesses. Small businesses are also less bureaucratic and more willing to take risks to grasp new opportunities (Rothwell and Dodgson, 1991).

WHAT'S IN IT?

There are reasons to believe that many SMEs can gain from e-commerce. Advantages of early e-commerce technologies such as EDI typically include reductions in transaction costs and delays, higher quality service, and improved operations management (Raymond and Bergeron, 1996). Raymond and Bergeron (1996) also point out that SMEs could gain more benefits from EDI. This could be achieved by providing a higher level of organizational support for EDI, such as management support, employees training, and obtaining the collaboration and support of all the departments and business partners involved.

Newer communication technologies, such as the Internet, are claimed to have opened up new markets and made geographic locations irrelevant (Premkumar and Roberts, 1999). This brings interesting opportunities to small companies, as well as additional risks (ibid.). The spread of the Internet has changed the way consumers and companies collect information and conduct their businesses. The Internet has brought the possibility to reach new markets and new customers, but has at the same time made it more difficult to keep old customers. Buyers can, with the help of the Internet, relatively easy find competing suppliers and compare their offers. As an increasing number of enterprises and consumers are using the Internet to seek information before their final purchase, the risk is obvious for companies without a Web presence: if the company does not exist on the Internet, it does not exist.

E-commerce is driven by a number of factors on both buyer and supplier sides: access to an affluent customer base, lower information dissemination costs, lower transaction costs, broader market reach, increased service, additional channels for customer feedback, and consumer and market research (Auger and Gallaugher, 1997). Small businesses using Internet commerce have perceived a decrease in communication costs and the rise of new opportunities (Poon and Swatman, 1999). These opportunities can, for example, consist of the discovery of new business partners or business networks as well as useful feedback from customers (ibid.).

E-commerce applications, whether external or internal, are expected to improve coordination with trading partners or internal business units, and facilitate information exchange within organizations as well as market creation to reach new customers (Riggins and Rhee, 1998). One way to increase the potential benefits for the small players is the use of different kinds of cooperative arrangements between a number of SMEs. For instance, Kettinger and Hackbarth (1997) claim that to the extent that small firms can leverage their limited resources with other small firms via cooperative electronic network connections, they may achieve economies of scale and create new sales opportunities that were not available prior to e-commerce. Network members are believed to often have complementary resources that make

the total benefits from being a network member larger than the sum of the individual parts (Poon, 2000).

The Web also offers an inexpensive way to market the company and to get new information (Turban et al., 2000). For companies with niche products or those wanting to conduct market research, the Web provides good possibilities (ibid.). Furthermore, the Web is said to be sparking an explosion of entrepreneurial activity by encouraging rapid experimentation with new business organizations and systems (Tenenbaum, 1998). Evidence has also been found that Internet commerce is increasing the competitive advantage of small businesses and the quality of information support (Poon, 2000). The benefits that Internet commerce brings to a corporation depend, however largely, on the percentage of customers and business partners that participate in Internet commerce (ibid.) This is due to the fact that the success of e-commerce and other inter-organizational systems depends on the number of external participants, while with internal IT systems, the success depends on the number of internal users.

According to this it seems that e-commerce can bring a number of benefits to SMEs. Small businesses are also under increasing pressure to use information systems to stay competitive or simply to survive (Thong, 2001). Even so the SMEs are hesitating. The crucial question is: *What's hindering the spread of e-commerce to SMEs?*

Barriers to E-Commerce

In the literature concerning barriers or inhibitors to implementing and adopting e-commerce technologies by SMEs, the issues discussed fall mainly into two categories: internal and external to the organization. Internal or organizational issues relate mainly to the lack of awareness and knowledge in SMEs and resource limitations. External issues, outside the sphere of influence of SMEs, include mainly technical considerations and the topic of external influence or support.

Internal Issues

There are a number of barriers related to information and communication technologies (ICT) that prevent SMEs from adopting and exploiting them for inter-organizational purposes (Chapman, James-Moore, Szczygiel, and Thompson, 2000). In this paragraph we discuss the internal issues that may hinder the adoption, summarized in Table 1 at the end of the paragraph. Many barriers relate to SMEs' lack of understanding of e-commerce potential opportunities and how to implement these techniques (ibid.). SMEs have been found to lack both an awareness of the potential benefits of the technology and the organizational readiness needed for the development of integrated EDI systems (Iacovou, Benbasat, and Dexter, 1995).

The diffusion of IT and EDI may in many cases be delayed because the managers fail to see the advantages of the technology (ibid.). Difficulties in perceiving any direct benefits may hinder both the adoption of Internet (Walczuch et al., 2000) as well as EDI adoption (Kuan and Chau, 2001). The lack of recognizable or measurable financial gains from Internet-based commerce is one such example (Vassilopoulou, Keeling, and Macaulay, 1999; Walczuch et al., 2000). The owner attitude towards growth and his or her perception of the business value of the Internet is another factor that is instrumental to the adoption decision (Levy and Powell, 2002). Similarly Poon and Swatman (1999) found that the lack of experiences of tangible benefits is a major e-commerce adoption barrier among SMEs.

Several studies describe lack of IT knowledge and technological expertise as a major hurdle to the adoption of different e-commerce technologies and procedures by SMEs (Iacovou et al., 1995; Damsgaard and Lyytinen, 1998; Bennet, Polkingham, Pearce, and Hudson, 1999; Kuan and Chau, 2001). In a study among Finnish SMEs supplying the automotive industry, Tuunainen (1998) found that particularly the smallest subcontractors rarely have the sufficient IT knowledge to fully utilize EDI. This is found to be still true in a more recent study conducted by Chau (2001). Again, in the Internet usage context, the lack of knowledge of technology has been cited as a major factor differentiating SMEs from larger firms (Haynes, Becherer, and Helms, 1998). In other studies this has been expressed as unfamiliarity with the Internet (Walczuch et al., 2000), lack of understanding of the e-commerce medium (Vassilopoulou et al., 1999), and limited knowledge of how the Web pages could contribute to the organizational strategy (McCue, 1999).

Small firms often lack suitable qualified technical specialists (Rothwell and Dodgson, 1991). They also tend to postpone the implementation of internal IS due to insufficient knowledge of how to implement it successfully (Thong, 2001). Most owners are aware of their lack of knowledge of IS and this results in doubts about given advice (Levy and Powell, 2000). The lack of knowledge also makes them reluctant to spend their limited resources on an area that they feel they do not control (ibid.).

Regardless of the technology in question, the technological development in SMEs is claimed to suffer from poor ability to manage technology as a strategic weapon, negative attitudes, and limited human resources as in-house expertise (Poon and Swatman, 1997; McCue, 1999; Buratti and Penco, 2001; Chau, 2001). Together, this indicates an insufficient organizational readiness. SMEs are also found to suffer from a lack of staff and time to investigate new technologies and systems (Bennett et al., 1999), as well as a reluctance to dedicate time and resources to resolve their lack of skills and understanding (Chapman et al., 2000).

Similarly, findings of a study conducted by Chen and Williams (1998) among UK small businesses also pointed out that SMEs tend to lack resources and experience, and seem to have difficulties in planning, designing or implementing EDI systems. Only few SMEs are recorded to have a full time IT professional, since IT-based systems are not regarded as an economically viable alternative (Stymne, 1996). This is in line with a study by Poon and Swatman (1999) who found that among the major barriers for SMEs not using Internet for their financial transactions is the fact that traditional transaction ways are perceived as robust and sound.

Table 1: Adoption Barriers of E-Commerce in SMEs — Internal Issues

Internet-based Electronic Commerce (EC)	**Electronic Data Interchange (EDI)**	**Information Systems (IS)/ICT in general**
Lack of understanding of opportunities (Chapman et al., 2000). *Owners perception of the business value* (Levy & Powell, 2002). *Lack of measurable financial gains* (Vassilopoulou et al., 1999; Walczuch et al., 2000; Poon & Swatman, 1999).	*Lack of awareness of the potential benefits* (Iacovou et al., 1995). *Perception of (too few) direct benefits* (Kuan & Chau, 2001).	*Lack of understanding of potential advantages* (Iacouvou et al., 1995).
Lack of IT-knowledge and technological expertise (Walczuch et al., 2000; Vassilopoulou et al., 1999; McCue, 1999; Haynes et al., 1998). *Lack of understading of implementation techniques* (Chapman et al., 2000).	*Lack of IT-knowledge and technological expertise* (Tuunainen, 1998; Chen & Williams, 1998; Iacovou et al., 1995; Damsgaard & Lyytinen, 1998; Bennett et al., 1999; Kuan & Chau, 2001).	*Lack of IT-knowledge and technological expertise* (Rothwell & Dodgson, 1991; Levy & Powell, 2000). *Lack of knowledge of implementation issues* (Thong, 2001).
Perceived cost (Deschoolmeester & Hee, 2000; Walczuch et al., 2000).	*Perceived cost* (Kuan & Chau, 2001; Saunders & Clark, 1992; Iacovou et al. 1995).	*Lack of financial resources* (Tuunainen, 1998; Bennett et al., 1999; McCue, 1999; Chapman et al., 2000).
Insufficient organizational readiness (Poon & Swatman, 1997; McCue, 1999). *Lack of human resources and time to investigate new technologies and systems* (Bennett et al., 1999). *Reluctance to dedicate time and resources to resolving their lack of understanding and skills* (Chapman et al., 2000).	*Insufficient organizational readiness* (Iacovou et al., 1995; Chau, 2001).	*Insufficient organizational readiness* (Buratti & Penco, 2001). *Lack of human resources to investigate new technologies and systems* (Stymne, 1996).

A weak financial position of SMEs and their resistance to invest in sophisticated systems involving complex telecommunications have been found as major barriers in several studies (Tuunainen, 1998; Bennett et al., 1999; McCue, 1999; Chapman et al., 2000). Saunders and Clark (1992) found that perceived cost has been a significant barrier to EDI adoption among small vendor firms. This result is consistent with findings of Iacovou et al. (1995) on SME EDI adoption and with a recent study conducted by Kuan and Chau (2001) on small businesses EDI adoption. Also the adoption and use of Internet technologies is found to be hindered by the cost and speed of Internet access, as well as by the cost of the start-up investment (Deschoolmeester and van Hee, 2000; Walczuch et al., 2000). Table 1 shows a summery of the internal issues that can hinder the adoption of different e-commerce technologies.

External Issues

Empirical investigations (e.g., MacKay, 1993; Iacovou et al., 1995) have suggested that a major reason why small companies become EDI-capable is due to external pressure, especially from trading partners. Insignificant influence by the industry and poor promotion campaigns by vendors and consultants are still found to play a role in slow diffusion of EDI (Chau, 2001) as well as Internet technologies (Poon and Swatman, 1997). Large firms wanting their smaller trading partners to adopt EDI can use a coercive or a supportive strategy (Premkumar et al., 1997). If the smaller trading partner is reluctant to adopt EDI, a coercive strategy consisting of creation of competitive pressures and threat of loss of business is sometimes used. The supportive strategy involves marketing the technology in such a way to help the smaller firms understand its advantages and sharing expertise with them (ibid.). Financial and technical assistance can be used to reduce the problems related to the smaller firms' organizational readiness (Iacovou et al., 1995). The latter strategy, even if costly, might be better in the long run to get as many partners connected as possible (Premkumar and Ramamurthy, 1995), but as both customer support and competitive pressure have proved to impact the adoption decision most firms need to use both strategies (Premkumar et al., 1997).

Another important barrier is the lack of a critical mass of electronically connected business partners. Previous studies have showed that low volumes of EDI transactions (Tuunainen, 1998), low volume of messages received over the Internet (Poon and Swatman, 1997), as well as concerns that suppliers and customers are not on-line (Walczuch et al., 2000) are barriers that prevents SMEs from investing time and money in new technologies. To be motivated to make a costly investment such as EDI, it is necessary that a majority of partners in the distribution chain, such as customers, suppliers, carriers, and banks adopt the

technology as well (Premkumar et al., 1997). Otherwise it may be impossible to obtain adequate benefits because the organization has to maintain a paper-based system in parallel with the EDI system (ibid.). Electronic marketplaces and databases of products or suppliers are other examples where there have been problems reaching the critical mass.

Furthermore, lack of security or perceived security hazards have been and still are a major concern among SMEs, whether in EDI, Internet, or other ICT adoption (Tuunainen, 1998; Poon and Swatman, 1999; Vassilopoulou et al., 1999; Deschoolmeester and van Hee, 2000; Walczuch et al., 2000). Legal issues (Deschoolmeester and van Hee, 2000), lack of standards (Tuunainen, 1998), still experimental payment systems, and limited services offered on the Internet (Poon and Swatman, 1999) are other important factors contributing to slow adoption of different e-commerce technologies.

Table 2: Adoption Barriers of E-Commerce in SMEs — External Issues

Internet-based Electronic Commerce (EC)	**Electronic Data Interchange (EDI)**
Insignificant influence by industry (Poon & Swatman, 1997).	*Insignificant influence by industry* (Chau, 2001). *Lack of external pressure from trading partners* (MacKay, 1993; Iacovou, 1995; Premkumar et al., 1997).
Poor promotion campaign by vendors (Poon & Swatman, 1997).	*Poor promotion campaign by vendors* (Chau, 2001).
Lack of critical mass (Poon & Swatman, 1997).	*Lack of critical mass* (Tuunainen, 1998; Premkumar et al., 1997).
Lack of security or perceived security hazards (Poon & Swatman, 1999; Vassilopoulou et al., 1999; Deschoolmeester & Hee, 2000; Walczuch et al.; 2000). *Lack of secure payment systems* (Poon & Swatman, 1999).	*Lack of security or perceived security hazards* (Tuunainen, 1998).
Legal issues (Deschoolmeester & Hee, 2000).	*Lack of standards* (Tuunainen, 1998).
Limited services offered on the Internet (Poon & Swatman, 1999).	

External consultants and IT vendors could play an important role in assisting small businesses to successfully adopt IS (Thong et al., 1996). However, the lack of impartial advice (Vassilopoulou et al., 1999) and the difficulty of access to expert help (Bennett et al., 1999) are still inhibiting the adoption of new technologies among SMEs. A further problem is that the attitudes towards consultants are ambiguous in SMEs (Stymne, 1996). Table 2 shows a summary of the external issues that can hinder the adoption of different e-commerce technologies. The table compares only barriers to EDI adoption with barriers to Internet adoption since the adoption of proprietary IS are expected to be mainly an internal decision, and therefore less influenced by external forces.

SUMMARY AND CONCLUSIONS

In this chapter we have analyzed e-commerce adoption and diffusion barriers in SMEs discussed in previous literature, with the intention to find similarities and differences between the barriers associated with the adoption of different technologies: ICT/IS in general, EDI, and Internet-based e-commerce. After having discussed the importance of small companies in any country's economy, the chapter has presented different definitions of SMEs and advantages and disadvantages of being small. The chapter has then touched upon some benefits that e-commerce can bring to SMEs and posed the question of why SMEs still are reluctant to adopt e-commerce. This leads to the second part of the chapter that looks in depth at e-commerce adoption and diffusion barriers.

We do not claim to have conducted an exhaustive literature review on barriers to e-commerce for SMEs. We believe, however, that we have produced a representative sample of a wide range of often-cited pieces of research on the topic. We divided the barriers or inhibitors found in earlier empirical studies into internal and external issues. Barriers created or maintained by external factors, such as weak industry influence, poor promotion campaigns, lack of critical mass, lack of security or perceived security hazards, as well as lack of standards are essentially areas where ICT vendors, industrial partners or associations, as well as authorities and policy makers can have an impact. Nevertheless, much more factors were found to fall into the internal or organizational category, including issues such as lack of awareness or understanding, lack of knowledge and skill, and lack of financial resources to invest into the ICT technologies. External players can influence the level of awareness. Furthermore, it could be expected that the significance of many organizational problems will diminish as the more computer literate generations take over the SMEs; but then again, the pace of technological development is unlikely to slow down, creating all new possibly hurdles particularly for non-IT profession-

als. Furthermore, the same factors that are hindering the adoption seem to go on being problematic once the SMEs have implemented e-commerce. Factors such as lack of IT expertise, limited resources, and lack of support have been found to also inhibit SMEs' ability to derive benefits when using e-commerce (Chau and Turner, 2002).

What can be deduced from our analysis is that whether we are talking about ICT in general, EDI, or lately Internet-based e-commerce, the barriers to adoption and use of them for SMEs have mostly remained the same. This is to some extent confirmed by a recent empirical study (Mehrtens, Cragg, and Mills, 2001). Both similarities and differences between EDI adoption and Internet adoption seem to exist (ibid.). In Internet adoption as in EDI adoption perceived benefits, organizational readiness, and external pressure were found to have impact on the adoption decision. However, the internal factors of these categories varies to some extent between EDI adoption and Internet adoption (ibid.) At the adoption of the Internet it is the level of knowledge of the non-IT professional, often the owner/manager, that is important rather then the knowledge of IT professionals. While the perceived benefits of EDI for example might include reduced inventory levels, the benefits expected from Internet adoption consist of cheap and effective customer interaction and information gathering as well as image building (ibid.) In EDI the external pressure often comes from major customers. According to Mehrtens et al. (2001) external pressure has an impact on Internet adoption too. This time the pressure comes from a wide group of Internet users, not only customers, but also suppliers and potential employees (ibid.).

What are the implications of this study? Certainly *not* that industry players, authorities, and researchers should drop the topic of looking into barriers of e-commerce for SMEs. The implication is, rather, that we have to stop reinventing the wheel, so to speak, in form of creating new lists of old barriers. What we have to do is to move on, and develop new tools for SMEs to bring them into a mutual information society. Researchers for example could develop normative research to help SMEs overcome some of the internal barriers, such as lack of knowledge and ability to manage technology as a strategic weapon, while policy makers could develop more and better programs to make it easier for SMEs to embrace e-commerce.

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