

Electronic Commerce Adoption in Small to Medium Enterprises (SMEs)



**A Comparative Study of SMEs in
Wollongong (Australia) and Karlstad (Sweden)**

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[May 2004]

Executive Summary

Electronic commerce (E-commerce) has been widely touted as a technology that enables small to medium enterprises (SMEs) to compete on par with their larger counterparts. Indeed, previous research has indicated that significant benefits are achieved by those SMEs that adopt and use E-commerce in their organizations. Amongst these are reduced costs, increased sales and the ability to reach a global market. The study presented in this report set out to determine whether SMEs in Wollongong were capitalizing on these benefits. In order to do so, it was necessary to examine the current rate of E-commerce adoption in Wollongong and compare it to the rate of adoption in a similar regional centre elsewhere to establish our rate of progress.

This report presents the findings of a study of E-commerce adoption in SMEs in Wollongong (Australia) and Karlstad (Sweden). A survey instrument was developed and used to collect responses from 474 SMEs in total. The questions contained in the survey addressed a number of key E-commerce adoption issues, including the reasons SMEs adopt E-commerce, the benefits and disadvantages of E-commerce adoption and the barriers or inhibitors to E-commerce adoption.

Although the findings are too numerous to summarise, several key statements can be made:

1. SMEs in Australia lag significantly behind their Swedish counterparts in E-commerce adoption.
2. E-commerce adoption and use in SMEs is determined by a number of business characteristics and it is not possible to develop a "one-size-fits-all" E-commerce solution for SMEs.
3. SMEs need to be re-educated about the benefits of E-commerce because this type of technology is still perceived by SMEs as being unsuitable to the way they do business.

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Chapter 1

Introduction

This report presents the findings of a study of small to medium enterprises (SMEs) in Wollongong (Australia) and Karlstad (Sweden). The study was undertaken by researchers at the University of Karlstad (Sweden) and the University of Wollongong (Australia) during the in 2001 and 2003. A total of 474 SMEs were surveyed about their use of electronic commerce (E-commerce) to determine the rate of E-commerce adoption and examine the following issues related to E-commerce adoption and use:

- the criteria (drivers) which lead SMEs to adopt and use E-commerce,
- the benefits of E-commerce adoption and use,
- the disadvantages of E-commerce adoption and use, and
- the barriers which inhibit SMEs from adopting and using E-commerce.

The aim of the study was twofold: to compare E-commerce adoption rates between two similar regional centres, and, in doing so, to examine the key issues that affect E-commerce adoption and use in SMEs. The results of the study described in this report are of use to both researchers and government organisations. The study represents a significant addition to the existing knowledge about E-commerce adoption and use in SMEs due to its broad scope. Furthermore, the results of the study form a useful starting point for designing and implementing E-commerce adoption initiatives for SMEs.

The report is structured as follows:

- Chapter 2 describes previous research in the area of SMEs and E-commerce adoption. This provides the context for the present study. Chapter 2 also includes a description of the methodology employed by the researchers.
- Chapter 3 provides information about the respondents. Both the business and information technology (IT) profiles of the respondents in Wollongong and Karlstad are presented and compared.
- Chapter 4 describes the results of the study for those SMEs that have adopted E-commerce. The criteria (drivers), benefits and disadvantages of E-commerce adoption are highlighted.
- Chapter 5 presents the findings for SMEs that have not adopted E-commerce. It provides an insight into the barriers that inhibit SMEs from adopting and using E-commerce in their organizations.
- Chapter 6 provides a brief conclusion and some key implications from the study.

Chapter 2

Background

2.1 Introduction

This chapter provides an overview of previous research into SMEs and E-commerce, and describes the methodology used to carry out the present study. The information presented in this chapter is based on an extensive review of prior research. The chapter begins with a description of the characteristics of SMEs in general. This is followed by a discussion of information technology (IT) adoption by SMEs prior to the advent of E-commerce. E-commerce technology is then described and the adoption and use of E-commerce technology by SMEs is examined. Four aspects of the adoption and use of E-commerce technology by SMEs are reviewed in particular. They are:

- criteria (drivers) leading to E-commerce adoption and use by SMEs
- benefits derived from the adoption and use of E-commerce by SMEs,
- disadvantages encountered following the adoption and use of E-commerce by SMEs, and
- barriers to the adoption and use of E-commerce in SMEs.

In examining the adoption and use of E-commerce by SMEs, previous research into business characteristics which facilitate E-commerce adoption is also presented. Finally, the description of the methodology utilised to undertake the present study is provided.

2.2 The Nature of Small to Medium Enterprises (SMEs)

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

Not only is there a myriad of views concerning the nature of SMEs, but from a governmental standpoint there are a variety of definitions of an SME, depending on the country being considered.

For example, in the late 1960's the Australian Federal Government commissioned a report from a committee known as the Wiltshire Committee. This report suggested the following flexible definition of any SME (Meredith, 1994, p 31):

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

The Wiltshire Committee concluded that normally this definition could be expected to apply to the majority of enterprises in Australia with fewer than 100 employees.

The United States based its definition on the position of the organisation within the overall marketplace. According to the United States Small Business Administration (SBA) which is based on section 3 of the Small Business Act of 1953:

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"An SME shall be deemed to be one which is independently owned and operated and which is not dominant in its field of operation."

By comparison, the United Kingdom took a more quantitative approach, defining an SME as:

"Having fewer than 50 employees and is not a subsidiary of any other company."

Like the governmental definitions of SMEs, research initiatives have applied a variety of definitions to the nature of SMEs. A study of Canadian SMEs by Montasemi (1988) based its definition on the number of employees, this being in accordance with the Canadian Small Business Guide (1984). Many studies (see Bradbard, Norris & Kahai, 1990; Chen, 1993) have based their model on the UK Companies Act - 50 employees or less.

More recently there has been a tendency for researchers to simply utilise a mailing list of SMEs supplied by a government agency, thus making decisions about the definitions of SMEs is the responsibility of government agencies, rather than the researcher. Examples of this approach can be seen in studies by Pendergraft, Morris and Savage (1987) and Delone (1988). An alternative approach was adopted by Chen (1993) who based his study on 260 companies randomly selected from the Norfolk Industrial Directory (1990, *cited in* Chen 1993), but where companies conformed to the definition of SMEs in the UK (i.e. they had fewer than 50 employees and were not a subsidiary company).

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

There have been many studies in the literature that have attempted to define the characteristics of SMEs. Central to all of these studies is the underlying realization that many of the processes and techniques that have been successfully applied in large businesses, do not necessarily provide similar outcomes when applied to SMEs. This is perhaps best summed up by Barnett and Mackness (1983) and Westhead and Storey (1996) who stated that SMEs are not 'small large businesses' but are a separate and distinct group of organizations compared to large businesses.

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

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

These early suggestions have been supported by more recent studies that have found most SMEs lack technical expertise (Barry & Milner 2002), most lack adequate capital to undertake technical enhancements (Gaskill et al, 1993; Raymond, 2001), most SMEs suffer from inadequate organisational planning (Tetteh & Burn, 2001; Miller & Besser, 2000) and many SMEs differ from their larger counterparts in the extent of the product/service range available to customer (Reynolds et al, 1994).

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

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Westhead & Storey (1996) and Hill & Stewart (2000)) and they have a strong desire to remain independent (this is supported by the findings of Dennis (2000) and Drakopolou-Dodd et al (2002)).

These findings are summarised in Table 1.

The differences between SMEs and their larger counterparts are highlighted even more when their approaches to IT are considered. Khan and Khan (1992) suggest that most SMEs avoid sophisticated software and applications. This view is supported by studies carried out by Chen (1993), Cragg and King (1993), Holzinger and Hotch (1993) and Delvecchio (1994).

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

FEATURES UNIQUE TO SMEs	REPORTED BY
SMEs have small and centralised management with a short range perspective	Bunker & MacGregor (2000) Welsh & White (1981)
SMEs have poor management skills	Blili & Raymond (1993)
SMEs exhibit a strong desire for independence and avoid business ventures which impinge on their independence	Dennis (2000) Reynolds et al (1994)
SME Owners often withhold information from colleagues	Dennis (2000)
The decision making process in SMEs is intuitive, rather than based on detailed planning and exhaustive study	Reynolds et al (1994) Bunker & MacGregor (2000)
The SME Owner(s) has/have a strong influence in the decision making process	Reynolds et al (1994) Bunker & MacGregor (2000)
Intrusion of family values and concerns in decision making processes	Dennis (2000) Bunker & MacGregor (2000) Reynolds et al (1994)
SMEs have informal and inadequate planning and record keeping processes	Reynolds et al (1994) Tetteh & Burn (2001) Miller & Besser (2000) Markland (1974) Rotch (1981)
SMEs face difficulties obtaining finance and other resources, and as a result have fewer resources	Cragg & King (1993) Welsh & White (1981) Gaskill & Gibbs (1994) Reynolds et al (1994) Blili & Raymond (1993)
SMEs are more reluctant to spend on information technology and therefore have limited use of technology	Walczuch et al (2000) Dennis (2000) MacGregor & Bunker (1996) Poon & Swatman (1997) Abell & Limm (1996)
SMEs have a lack of technical knowledge and specialist staff and provide little IT training for staff	Martin & Matlay (2001) Cragg & King (1993) Bunker & MacGregor (2000) Reynolds et al (1994) Welsh & White (1981) Blili & Raymond (1993)
SMEs have a narrow product/service range	Bunker & MacGregor (2000) Reynolds et al (1994)

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FEATURES UNIQUE TO SMEs	REPORTED BY
SMEs have a limited share of the market (often confined towards a niche market) and therefore heavily rely on few customers	Hadjimanolis (1999) Lawrence (1997) Quayle (2002) Reynolds et al (1994)
SMEs are product oriented, while large businesses are more customer oriented	Reynolds et al (1994) Bunker & MacGregor (2000) MacGregor et al (1998)
SMEs are not interested in large shares of the market	Reynolds et al (1994) MacGregor et al (1998)
SMEs are unable to compete with their larger counterparts	Lawrence (1997)
SMEs have lower control over their external environment than larger businesses, and therefore face more uncertainty	Westhead & Storey (1996) Hill & Stewart (2000)
SMEs face more risks than large businesses because the failure rates of SMEs are higher	Brigham & Smith (1967) DeLone (1988) Cochran (1981)
SMEs are more reluctant to take risks	Walczuch et al (2000) Dennis (2000)

It is appropriate that we now examine the acquisition and use of computer technology by SMEs prior to the onset of E-commerce.

2.3 Pre E-commerce Acquisition and Use of IT by SMEs

This section is premised on the view that E-commerce is not just another technology that sustains and enhances business practice: it is an innovation that has disrupted traditional ways of doing business. This premise, which is elaborated upon further on, is well supported in the literature (see Lee, 2001; Kuljis et al, 1998; Giaglis et al, 1988; Fuller, 2000; Kendall & Kendall, 2001).

The premise is important for several reasons. Firstly, E-commerce has altered the day-to-day practices of many businesses (Fuller, 2000). According to Lee (2001), where once a company used raw materials, transformed those raw materials into products, displayed those products, and ultimately sold those products to customers, with E-commerce this has changed. Now, the raw materials are information about the customer, the transformation is the synthesis and packaging of this information, the products are designed, very often, by the customer and are sold with information services to entice future interaction.

Secondly, the focus of technology acquisition has altered from production within the organization to marketing between organizations. Indeed, Treacy and Wiersema (1997) have suggested that E-commerce transforms organizations that were 'geared towards' production excellence into organizations 'geared towards' customer intimacy.

Thirdly, in a pre-E-commerce environment, benefits, or disadvantages, of technology were planned, tangible and controllable by the organization. With E-commerce, many of the benefits and disadvantages have become less tangible and far more difficult to plan for and manage. Added to this is the fact that many of the benefits, as well as the disadvantages, are unique to E-commerce. Some of the benefits include new customers and markets (Ritchie & Brindley, 2001; Quayle, 2002; Raymond, 2001; Vescovi, 2000), improved marketing techniques (Sparkes & Thomas, 2001) and improved relations with business partners (Poon & Swatman, 1997). Some of the disadvantages of E-commerce adoption, reported in the literature included security risks (Ritchie & Brindley, 2001), reduced flexibility of work (Lee, 2001) and duplication of work effort (MacGregor et al, 1998).

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Perhaps the most important reason for distinguishing E-commerce from other technologies is the notion that the adoption and use of E-commerce cannot be based on the same criteria as was used for other technology adoption. A number of authors suggest that to base E-commerce adoption and use on criteria used in other technology adoption produces a naïve, over-simplistic, linear model, whose focus is organizationally based rather than interorganisationally directed (Culkin & Smith, 2000; Martin & Matlay, 2001).

This section, then, is a prelude to an examination of E-commerce, and considers the adoption and use of technology prior to the advent of E-commerce. In line with the views of Faia-Correia et al (1999), who suggest that technology shapes and is shaped by the organization, it is appropriate to consider the organizational context prior to the advent of E-commerce, and in turn, the acquisition and use of technology in that context.

Prior to the advent of E-commerce, most organizations were essentially hierarchical in nature. They exhibited a unity of purpose and were primarily concerned with extending control over resources considered essential to the quality of their products. Communications within such a structure was essentially uni-dimensional (i.e. information flowed in a single direction only), and technology introduced into the business was normally focused on production. As such, the acquisition of technology could be evaluated against tangible inputs and outputs. Thus, while technology might have re-shaped the organisation, these changes were predictable and planned, reinforcing rather than disrupting organisational boundaries.

Prior to the advent of E-commerce, organizations relied primarily on a product base that was supported by stand-alone technology. The products themselves were tangible, requiring physical inputs and processes, which could be clearly evaluated. This meant that the introduction of technology into these processes could be evaluated and directed towards aggregated financial effects, and outcomes were related to the revenue goals of the entire organisation. Technology was designed to embody existing organisational values and practices, power relationships and conventions. As such, strategies were fixed and controllable (Kuljis et al, 1998). While technology supported these strategies and the products offered by the organisation, it was bounded by the nature of those same products. Its role was simply to increase efficiency, within the boundaries of the products at a procedural level (Schneider, 1999).

Prior to E-commerce, organizations were also able to utilise technology to enforce the use of specific products and product boundaries. This was achievable by limiting the number and types of products and by placing the boundaries within the operational level of the organisation. Factors that might be termed "informal social ties" (customers, competitors, environmental trends) were 'shadows' to the formal organisation. The focus, instead, was on computerising procedures to achieve low-level operational competence, and the decision to invest in computer technology were primarily concerned with improvements in efficiency and effectiveness. Investment decisions were carried out in terms of strict boundaries and were judged on rigid internal perspectives. An organisation considering the adoption of technology examined the Return on Investment (ROI) of such technology where the ROI was defined within a pre-stated set of strategic guidelines. Willcocks et al (1998) consider that, under such organisational models, the metrics and criteria used in the acquisition of computer technology remained static and were still able to give a valid picture of organisational requirements.

2.3.1 Criteria Used in the Pre E-commerce Adoption of IT by SMEs

A combined study of Danish, Irish and Greek SMEs carried out in the early 1990's by Neergaard (1992) concluded that there were four main reasons for the acquisition of IT by SMEs. These were increased productivity, streamlining work procedures, better client service and better record keeping. Fink and Tjarka (1994) in a study of Australian executives collapsed two of the categories (streamlining work procedures and better client services) but provided similar reasons to Neergaard for IT acquisition. They described their three reasons for acquisition as 'doing the right thing', 'doing things right' and 'improving the bottom line'. Table 2 provides a mapping of the two sets of categories.

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Table 2: IT adoption criteria categories

Neergaard's (1992) Criteria	Fink & Tjarka's (1994) Criteria
Increased productivity	Improving the bottom line
Streamlining work procedures	Doing the right thing
Customer service	Doing the right thing
Better record keeping	Doing things right

Fink and Tjarka (1994) concluded that while larger businesses were demonstrating a shift from 'doing things right' to 'doing the right thing', this shift was less visible in SMEs. This conclusion is supported by a number of studies (see Chen, 1993; MacGregor & Bunker, 1996a & 1996b; Amer & Bain, 1990).

A number of reasons were suggested to explain SMEs' continued focus on the operational use of technology. MacGregor and Bunker (1996a), in line with the findings of Welsh and White (1981), suggested that most SMEs tended to have a short-range management perspective and appeared more concerned with improving the day-to-day internal nature of the business than with seeking new markets or customers. They added that control mechanisms were often informal, were centralised and were coupled with reluctance, by most SMEs, to take risks. This reduced the need for long-term decision-making. Added to this was a management that, more often than not, was product oriented rather than customer oriented (Reynolds et al, 1994; MacGregor et al, 1998; Bunker & MacGregor, 2000).

It is interesting to note that Fink and Tjarka (1994) posit a gradual movement from 'doing things right' to 'doing the right thing' in larger businesses. MacGregor and Bunker (1996a) found that SMEs that had based their IT acquisition criteria on 'doing the right thing' or 'improving the bottom line' reported significantly less success than those that based their acquisition criteria on 'doing things right'.

2.3.2 Factors Affecting Pre E-commerce IT Acquisition and Use in SMEs

Martin and Matlay (2001, p 400) suggest that many initiatives aimed at promoting IT acquisition and use in SMEs fall into the trap of viewing the SME sector as a homogeneous group that are able to take a well ordered, sequential approach to technology adoption. They continue by suggesting that:

"the targets and, in particular, the way in which they are defined, point towards a 'generalist' view of small business operation that largely fails to differentiate between businesses of varying business sizes, ethnic origin, stages of adoption etc."

There are a number of studies in the literature that point to a variety of business characteristics affecting the adoption and use of IT in SMEs. Indeed, several researchers (Poon & Swatman, 1997; Hyland & Matlay, 1997) stress that the differing effects of some of these business characteristics often makes it impossible to generalise findings across the entire SME community.

It is appropriate, then to consider some of these findings.

A number of studies (Fallon & Moran, 2000; Lal, 2002; Matlay, 2000; Matlay & Fletcher, 2000; Culkin & Smith, 2000; Riquelme, 2002) have found that business size (in terms of the number of employees as well as turnover) is significantly associated with the adoption of IT. Culkin and Smith (2000) suggest that larger SMEs are by nature inherently more complex and thus decisions concerning IT acquisition require more detailed examinations of the impact of IT. Larger SMEs tend to adopt more sophisticated systems and very often are more likely to 'computerise' far more of their business than smaller SMEs. Matlay and Fletcher (2000) noted that these findings did not appear to be localised or country-specific.

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Recent studies (Martin, 1999; Martin et al, 2001) have examined SMEs in terms of location. These studies suggest that those SMEs in rural or regional locations often report lower levels of success with IT adoption when compared to those in capital cities or large economic centres. A number of explanations have been put forward, including a heavier reliance on vendors in regional areas than in larger centres and the failure of vendor groups to fully understand the nature of the business they are servicing.

Kai-Uwe Brock (2000), in a study of SME adoption of IT suggests that another important business characteristic appears to be business age. Businesses that have a long-established set of work practices will very often avoid any form of IT intervention that threatens to disrupt those long-held practices.

Studies by Dibb (1997), MacGregor and Bunker (1999), Bennett and Robson (1998), Meikle and Willis (2002), and MacGregor et al (2002) have found that business sector is significantly associated with the level and type of IT use in SMEs. These studies found that the manufacturing and retail sectors tended to adopt IT far more quickly than professional or service related SMEs. Unlike the studies relating to business size, the business sector studies cannot be considered 'global'. For example, while Australian studies (MacGregor & Bunker, 1999; MacGregor et al, 2002) found a higher uptake of IT in the manufacturing and retail sectors, Riquelme (2002), in a study of adoption of technology in China found that service related businesses were adopting IT at the same rate as retail groups.

A number of studies (Poon & Swatman, 1997; Donckels & Lambrecht, 1997; Lauder & Westhall, 1997; Blackburn & Athayde, 2000) have examined the impact of internationalisation by SMEs in their adoption of IT. While all studies have been prescriptive, enunciating the steps to be taken in order to utilise technology in an international market, each identifies market focus as being a business characteristic associated with the level and depth of IT adoption and use.

Another business characteristic that appears to be significantly associated with IT adoption and use is the level of IT expertise. Studies in Singapore (Yap et al, 1992; Thong et al, 1996) and Australia (MacGregor & Bunker, 1996; MacGregor et al, 1998) have shown that the level of IT skill within the SME is a strong determinant of the type of IT acquired as well as the ongoing success with that IT.

Thus, it can be seen that a number of business characteristics, including business size, business age, business sector, market focus and level of IT expertise are associated with adoption and use of IT in SMEs.

Before examining the nature of post E-commerce technology adoption, it is appropriate that we consider the nature of E-commerce itself.

2.4 Electronic Commerce

There are nearly as many definitions of E-commerce as there are contributions to the literature. Turban et al (2002, p 4) define E-commerce as:

“an emerging concept that describes the process of buying, selling or exchanging services and information via computer networks.”

Choi et al (1997, cited in Turban et al, 2002) draw a distinction between what they term pure E-commerce and partial E-commerce. According to Choi et al, 'pure E-commerce' has a digital product, a digital process and a digital agent. All other interactions (including those that might have one or two of the three nominated by Choi et al) are termed 'partial E-commerce'.

Raymond (2001, p 411) defines E-commerce as:

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“functions of information exchange and commercial transaction support that operate on telecommunications networks linking business partners (typically customers and suppliers).”

Damanpour (2001, p 18), by comparison, defines E-commerce as:

“any ‘net’ business activity that transforms internal and external relationships to create value and exploit market opportunities driven by new rules of the connected economy.”

For the purposes of this study, which examines changes to the organisation brought about by involvement in E-commerce, the definition provided by Damanpour is used. While it may be argued that other definitions do not preclude organisational transformation, only the definition of Damanpour ‘demands’ those transformations and it is consistent with the concept in the literature, generally.

It is these organisational changes, rather than the definition, that needs to be addressed.

As already stated, E-commerce is not just another mechanism to sustain or enhance existing business practices. It is a paradigm shift that is radically changing traditional ways of doing business. Dignum (2002) believes that although IT is an important component, the biggest mistake made by many organizations is that they believe that by simply introducing E-commerce technology, they would succeed without having to worry about their organisational structure. If, as suggested by Treacy and Wiersema (1997), E-commerce transforms a company from one geared towards ‘production excellence’ to one geared towards ‘customer intimacy’, E-commerce is not about technology but about a new way of treating customers and suppliers. Achrol and Kotler (1999), in a discussion of marketing within a network economy, describe this transformation as a shift from being an ‘agent of the seller’ to being an ‘agent of the buyer’. Thus, according to Lee (2001), the biggest challenge for most organisations is not how to imitate or benchmark the best E-commerce model, but how to fundamentally change the mindset of management away from operating as a traditional business.

Fundamental to any changes to traditional business procedures is the realisation that E-commerce, unlike any previous technological innovation, has a locus of impact not within the organisation but at an interorganisational level. Thus, a traditional management focus, which included total quality management, lean manufacturing and business process re-engineering (collectively termed *economics of scarcity* by Lee, 2001), are replaced by gathering, synthesis and distribution of information (collectively termed *economics of abundance* by Lee, 2001). Output for organisations can no longer simply be finished products, but must include information and information services, bundled for customer use.

Not only has E-commerce changed the rules pertaining to processes within the organisation, it has had a profound effect on the structure of organisations.

The advent of E-commerce has seen a radical change away from the hierarchical-based philosophy. Organisations that were once ‘housed’ within strict product-based boundaries are now having to operate and compete at a global level and strict hierarchies appear less adept in the turbulent global market. Functions such as marketing, that were once organisational and product-based (i.e. a select set of products was marketed by an individual organization) are now becoming interorganisational and knowledge-based (multiple organizations continually adjusting their operations to meet changing customer needs and passing on information, rather than strictly products, to their customers). Indeed, Achrol and Kotler (1999, p 146) suggest that

“Driven by a dynamic and knowledge-rich environment, the hierarchical organisations of the 20th century are disaggregating into a variety of strategic alliance forms.”

Not only has E-commerce altered perceptions of organisational structure and function (see Kuljis et al, 1998; Giaglis et al, 1999) it has altered the use of technology within the organisation (Fuller, 2000;

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Kendall & Kendall, 2001). Where once technology supported the hierarchical structure, it is technology that is driving the evolution away from it.

For larger businesses there have been a variety of approaches. Some businesses are moving entirely to a web-based presence (Lee, 2001), some are establishing subsidiaries which ultimately become stand-alone, online businesses (see Gulati & Garino, 2000), others are merging with online businesses. In all cases, there has been a realisation that multi-level hierarchies, with their inability to react to external change, need to be replaced by flatter structures that are adaptable to an ever-changing external environment.

The changes brought about by E-commerce have not only affected large businesses, but have had a profound effect on SMEs. Where large business is being encouraged to outsource many of its activities and evolve from a hierarchical structure to a flatter network structure, SMEs are being encouraged to pool their limited skills into small business strategic alliances.

2.5 E-commerce and SMEs

Studies carried out at the onset of E-commerce (Nooteboom, 1994; Acs et al, 1997; Murphy, 1996; McRea, 1996; Gessin, 1996; Auger & Gallagher, 1997) predicted that, since SMEs had always operated in an externally uncertain environment, they were more likely to benefit from E-commerce.

Other authors, while agreeing in principle with this viewpoint, did so with a degree of caution. Hutt and Speh (1998) felt that most areas of the SME sector, with the exception of those SMEs involved in the industrial market, would benefit from E-commerce. They suggest that the industrial SMEs already concentrated on an established base of customers and product offerings. Swartz and Iacobucci (2000) felt that the service industries would benefit far more than other areas of the SME community.

Other studies (Reuber & Fischer, 1999; Keeley & Knapp, 1995) felt that the business age was a strong predictor of relative benefit of E-commerce adoption, suggesting that older businesses would not adopt as easily as newer ones.

Among the predicted benefits available to SMEs were:

- A global presence presenting customers with a global choice (Barry & Milner, 2002)
- Improved competitiveness (Auger & Gallagher, 1997)
- Mass customisation and 'customerisation', presenting customers with personalised products and services (Fuller, 1993)
- Shortening of supply chains, providing rapid response to customer needs (Barry & Milner, 2002)

Recent studies have found that these predictions have not eventuated and that it has been the larger businesses that have been more active with respect to E-commerce (see Riquelme, 2002; Roberts & Wood, 2002; Barry & Milner, 2002). A number of reasons have been put forward, including poor security, high costs, a lack of requisite skills. However, some researchers have begun to examine how decisions concerning IT adoption and use are made in the SME sector.

As already stated, there have been many governmental as well as privately funded projects attempting to further the cause of adoption of E-commerce by SMEs. Unfortunately many of these projects relied on pre E-commerce criteria and focused on internal systems within the SME rather than interorganisational interaction (Poon & Swatman, 1997; Fallon & Moran, 2000; Martin & Matlay, 2001). The resulting models were step-wise or linear, beginning with email, progressing through website, to E-commerce adoption and finally organisational transformation. Not only are these models based on inappropriate or oversimplified criteria (Kai-Uwe Brock, 2000), but they recommend the adoption of E-commerce prior to any form of organisational change.

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

For SMEs, the changes associated with E-commerce have produced both positive and negative effects. Studies by Raymond (2001) and Ritchie and Brindley (2000) found that, while E-commerce adoption has eroded trading barriers for SMEs, this has often come at the price of altering or eliminating commercial relationships and exposing the business to external risks. Lawrence (1997), Tetteh and Burn (2001) and Lee (2001) contend that E-commerce adoption fundamentally alters the internal procedures within SMEs. Indeed, Lee (2001) adds that the biggest challenge to SMEs is not to find the best E-commerce model but to change the mindset of the owner/managers themselves. For those who have developed an organisation-wide strategy (in anticipation of E-commerce), these changes can lead to an increase in efficiency in the business. For those who have not, this can reduce the flexibility of the business (Tetteh & Burn, 2001) and often lead to a duplication of the work effort (MacGregor et al, 1998).

A number of studies have examined both the tangible and intangible benefits achieved by SMEs from the adoption of E-commerce. Studies by Abell and Limm (1996), Poon and Swatman (1997) and Quayle (2002) found that the tangible benefits derived from E-commerce (such as reduced administration costs, reduced production costs, reduced lead-time, increased sales), were marginal in terms of direct earnings. These same studies found that the intangible benefits (such as improvement in the quality of information, improved internal control of the business, improved relations with business partners) were of far greater value to SMEs.

2.6 The Acquisition and Use of E-commerce by SMEs

There have been many studies carried out over the last decade that have examined the adoption/non-adoption, benefits/disadvantages of E-commerce in SMEs. A comparison of some of these studies has revealed conflicting results. For example, Poon and Swatman (1997) found that E-commerce led to improved relationships with customers, while Stauber (2000) noted a decline in contact with customers. Some of these differences are clearly due to the nature of the research. However, many of the differences are a consequence of the non-homogeneous nature of the SME sector.

Much of the recent research carried out in examining E-commerce adoption and use in SMEs falls under one of four headings:

- criteria (drivers) leading to E-commerce adoption and use by SMEs
- benefits derived from the adoption and use of E-commerce by SMEs,
- disadvantages encountered following the adoption and use of E-commerce by SMEs, and
- barriers to the adoption and use of E-commerce in SMEs.

These will now be examined separately.

2.6.1 Criteria (Drivers) for the Adoption and Use of E-commerce in SMEs

A study carried out on 146 SMEs by Poon and Swatman (1997) provided 5 'drivers' or criteria for E-commerce adoption by respondents. These were: new modes of direct or indirect marketing, strengthening of relationships with business partners, the ability to reach new customers, improvement to customer services and the reduction of costs in communication. Similar studies have been carried out in a variety of SME communities. Some of the criteria for adoption and use have been similar to those found by Poon and Swatman, others have provided alternative responses. Abell and Limm (1996) found that reduction in communication costs, improvement in customer services, improvement in lead time and improvement in sales were the major criteria for E-commerce adoption

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and use, adding that external technical support was considered vital to any adoption and use strategies.

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

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

A number of studies (Reimenschneider & Mykytyn, 2000; Power & Sohal, 2002) have found that some SMEs have adopted E-commerce nominating pressure from customers as one of the motivating criteria. For convenience, a summary of research on criteria is provided in Table 3.

Table 3: Summary - Criteria used by SMEs in the decisions to adopt and use e-commerce

CRITERIA (DRIVERS)	REPORTED BY
Demand/Pressure from customers	Power & Sohal (2002) Reimenschneider & Mykytyn (2000) Price Waterhouse Coopers (1999)
Pressure of competition	Raisch (2001) Poon & Strom (1997)
Pressure from suppliers	Raymond (2001) Lawrence (1997) MacGregor & Bunker (1996) Reimenschneider & Mykytyn (2000)
Reduction of costs	Raisch (2001) Auger & Gallagher (1997) Abell & Limm (1996)
Improvement to customer service	Power & Sohal (2002) Auger & Gallagher (1997) Abell & Limm (1996) Senn (1996)
Improvement in lead time	Power & Sohal (2002) Reimenschneider & Mykytyn (2000) Abell & Limm (1996)
Increased sales	Lee (2001) Phan (2001) Abell & Limm (1996)
Improvement to internal efficiency	Porter (2001)
Strengthen relations with business partners	Raymond (2001) Evans & Wurster (1997) Poon & Swatman (1997)
Reach new customers/markets	Power & Sohal (2002) Reimenschneider & Mykytyn (2000) Poon & Swatman (1997) Lawrence (1997)

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CRITERIA (DRIVERS)	REPORTED BY
Improve competitiveness	Raymond (2001) Turban et al (2000) Reimenschneider & Mykytyn (2000)
External technical support	Abell & Limm (1996)
Improve marketing	Power & Sohal (2002) Poon & Swatman (1997) Lawrence (1997)
Improve control and follow-up	Domke-Damonte & Levsen (2002) Poon & Joseph (2001) Auger & Gallagher (1997)

2.6.2 Benefits derived from the adoption and use of E-commerce by SMEs

As already suggested, many of the substantial benefits provided by E-commerce fall into the category of intangible benefits and are often not realised by owner managers at the time of E-commerce adoption.

Studies by Poon and Swatman (1997) and Abell and Limm (1996) found that SMEs benefited in their ability to reach new customers and new markets through the use of E-commerce. This finding has been supported in more recent studies (Vescovi, 2000; Ritchie & Brindley, 2001; Sparkes & Thomas, 2001; Raymond, 2001; Quayle, 2002).

Earlier studies found that other benefits reported by SME operators included reduced production costs (Poon & Swatman, 1997; Abell & Limm, 1996), lowering of administration costs (Poon & Swatman, 1997; Abell & Limm, 1996), reduced lead time (Abell & Limm, 1996), increased sales (Abell & Limm, 1996), improved relations with business partners (Poon & Swatman, 1997) and improved quality of information (Poon & Swatman, 1997; Abell & Limm, 1996).

A recent study by Quayle (2002) found that benefits derived from E-commerce use, as reported by SME owner/managers, included reduced administration costs, reduced production costs, reduced lead time, reduced stock, improved marketing and improved quality of information. Again, for convenience these results are summarised in Table 5.

Table 4: Benefits found by SMEs in their use of e-commerce

BENEFITS	REPORTED BY
Lower administration costs	Quayle (2002) Poon & Swatman (1997) Abell & Limm (1996)
Lower production costs	Quayle (2002) Poon & Swatman (1997) Abell & Limm (1996)
Reduced lead time	Quayle (2002) Poon & Swatman (1997) Abell & Limm (1996)
Reduced stock	Quayle (2002)
Increased sales	Abell & Limm (1996)
Increased internal efficiency	Tetteh & Burn (2001) MacGregor et al, 1998

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BENEFITS	REPORTED BY
Improved relations with business partners	Poon & Swatman (1997)
New customers and markets	Quayle (2002) Ritchie & Brindley (2001) Raymond (2001) Sparkes & Thomas (2001) Vescovi (2000)
Improved competitiveness	Vescovi (2000)
Improved marketing	Sparkes & Thomas (2001) Vescovi (2000) Quayle (2002)
Improved quality of information	Quayle (2002) Poon & Swatman (1997) Abell & Limm (1996)

2.6.3 Disadvantages of E-Commerce adoption and use by SMEs

E-commerce has always carried the stigma of poor security. Innumerable studies have pointed to the perceived lack of visible security as a reason for non-acceptance of the technology, both by businesses and customers (see as examples Lawrence, 1997; MacGregor et al, 1998). Recent studies, however, have identified a number of other disadvantages incurred by SME operators in their day-to-day use of E-commerce technologies.

Raymond (2001), in examining the removal of business intermediaries by E-commerce, noted a deterioration of relationships with business partners and customers. He termed this effect as 'disintermediation'. Similar findings have been presented by Stauber (2000). Stauber also found that many SME operators complained of increasing costs in their business dealings attributable to E-commerce use.

Lawrence (1997) found that E-commerce, particularly but not exclusively, EDI, resulted in reduced flexibility of work practices and heavier reliance on the technology. Her findings are supported in studies by MacGregor et al (1998), Lee (2001) and Sparkes and Thomas (2001).

MacGregor et al (1998), in a study of 131 regional SMEs in Australia found that many respondents complained that they were doubling their work effort, this, in part, being due to the E-commerce systems not being fully integrated into the existing business systems in the organisation. They also found that many respondents complained that the technology had resulted in higher computer maintenance costs.

Again, for convenience, these studies are summarised in Table 5.

Table 5: Disadvantages found by SMEs following their adoption of E-commerce

DISADVANTAGES	REPORTED BY
Deterioration of relations with business partners	Raymond (2001) Stauber (2000)
Higher costs	Stauber (2000) MacGregor et al (1998)
Computer maintenance	MacGregor et al (1998)
Doubling of work	MacGregor et al (1998)

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DISADVANTAGES	REPORTED BY
Reduced flexibility of work	Lee (2001) MacGregor et al (1998) Lawrence (1997)
Security issues	Ritchie & Brindley (2001)
Dependence on E-commerce (non E-commerce procedures done using E-commerce formats)	Sparkes & Thomas (2001) MacGregor et al (1998)

2.6.4 Barriers to the Adoption of Electronic Commerce in SMEs

Hadjimanolis (1999), in a study of E-commerce adoption by SMEs in Cyprus, considers that barriers to E-commerce adoption can be categorised as either external or internal to the organisation. External barriers include difficulties in obtaining finance, difficulties in obtaining technological information and difficulties choosing the appropriate hardware and software. These difficulties he terms supply barriers. He further nominates two other sub-categories of external barriers which he terms demand barriers and environmental barriers. Demand barriers found by Hadjimanolis include E-commerce not fitting with products and services offered or not fitting with the way their customers wished to conduct their business. Environmental barriers found by Hadjimanolis included complicated governmental regulations and security concerns.

Hadjimanolis subdivided his internal barriers into two categories. These he termed resource barriers (which included lack of management enthusiasm and lack of technical expertise) and systems barriers (which included E-commerce not fitting with current business practices).

In a similar study, Lawrence (1997) defined three categories. These she termed company, personal and industry barriers. Company barriers, found by Lawrence, included low level of technology use within the business, limited financial and technical resources available, organisational resistance to change and lack of perceived return on investment. Barriers categorised as personal included lack of information on E-commerce, management preferring conventional approaches to business practice and inability to see the advantages of using E-commerce. Industry barriers included some respondents believing that the industry, as a whole was not ready for E-commerce technology.

A number of other research initiatives, while not providing categories of perceived barriers have produced similar findings to those of Lawrence and Hadjimanolis. Puro and Campbell (1998), who conducted a series of interviews with SME owners, found that major barriers included a failure to see any advantage in using E-commerce. They also found that lack of technical know how, prohibitive set up costs and security concerns were strong disincentives to many SME owner/managers. Abell and Limm (1996) found many SME owner/managers felt that E-commerce did not suit either their day-to-day business procedures or the product mix offered by their business.

In a cross-cultural study of SMEs in Hong Kong and Finland, Farmoohand et al (2000) found that both cultures reported a lack of technical know how and a failure to see how E-commerce fitted the current mode of business practices.

Recent studies have shown that many of the barriers reported in the late 1990's by Lawrence and Hadjimanolis are still current in today's SMEs. Tambini (1999) and Eid et al (2002) found that SME managers are still not convinced that E-commerce fits the products or services that their businesses offer. Studies by Bakos and Brynjolfsson (2000), Sawhney and Zabin (2002), and Merhtens et al (2001) have found that there is still a reluctance for SME managers to adjust their businesses to the requirements and demands placed on it by E-commerce participation. Bakos and Brynjolfsson (2000) and Kulmala et al (2002) found that many SMEs felt that E-commerce did not suit the current mix of customers while Chau and Hui (2001) have reported that many respondents did not see any advantage to using E-commerce in their businesses. Other barriers reported in the literature include a

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reported lack of technical know how (Mirchandani & Motwani, 2001), security concerns (Oxley & Yeung, 2001; Reimenschneider & McKinney, 2001) and cost concerns (Ratnasingham, 2000; Reimenschneider & McKinney, 2001). For convenience these barriers are summarised in Table 6.

Table 6: Barriers to E-commerce adoption by SMEs

DISADVANTAGES	REPORTED BY
E-commerce doesn't fit with products/services	Eid et al (2002) Kendall et al (2001) Tambini (1999) Hadjimanolis (1999)
E-commerce doesn't fit with the way we do business	Sawhney & Zabin (2001) Mehrtens et al (2001) Bakos & Brynjolfsson (2000) Farhoomand et al (2000) Poon & Swatman (1999) Abell & Limm (1996)
E-commerce doesn't fit the way our customers work	Kulmala et al (2002) Bakos & Brynjolfsson (2000) Hadjimanolis (1999)
We don't see the advantages of using E-commerce	Lee & Runge (2001) Chau & Hui (2001) Purao & Campbell (1998) Lawrence (1997) Hadjimanolis (1999)
Lack of technical know how	Mirchandani & Motwani (2001) Farhoomand et al (2000) Purao & Campbell (1998) Hadjimanolis (1999)
Security risks	Oxley & Yeung (2001) Reimenschneider & McKinney (2001) Purao & Campbell (1998) Aldridge et al (1997) Hadjimanolis (1999)
Cost too high	Reimenschneider & McKinney (2001) Ratnasingam (2000) Purao & Campbell (1998) Lawrence (1997) Hadjimanolis (1999)
Not sure what hardware/software to choose	Farhoomand et al (2000) Purao & Campbell (1998) Hadjimanolis (1999)

2.7 Business Characteristics Affecting the Adoption and Use of E-commerce by SMEs

A number of studies have been carried out to determine which business characteristics may affect SME adoption of E-commerce technology. Hawkins et al (1995), Hawkins and Winter (1996), and Hyland and Matlay (1997) have noted that because SMEs are diverse in terms of business size, business sector, market etc, results are not generalisable across the entire SME sector.

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Fallon and Moran (2000) found significant links between the business size of the SME in terms of the number of employees and the level of internet adoption. Matlay (2000) showed that the business sector was significantly associated with E-commerce adoption. Both studies showed that the same results were achievable despite varying geographic spread or market focus. These studies showed that smaller SMEs (fewer than 10 employees) were less likely to adopt E-commerce technology than larger SMEs. They also found that service organisations were more likely to adopt E-commerce than manufacturing or retail based SMEs. Riquelme (2002), in a study of 75 Chinese SMEs found that those involved in service tended to adopt E-commerce far more than their manufacturing counterparts.

Blackburn and Athayde (2000) identified not only business size and business sector but also the level of international marketing as a business characteristic associated with adoption of E-commerce technology.

As with the pre-E-commerce adoption of IT, a number of studies (Tetteh & Burn, 2001; O'Donnell et al, 2001) have concluded that successful E-commerce adoption is associated with both the level of IT skill within the SME as well as with the development, prior to E-commerce adoption, of business wide systems. These studies support earlier findings with EDI adoption (see MacGregor et al, 1998; Iacovou et al, 1995; Turban, 2000).

In a study of 102 SMEs, Mazzarol et al (1999) found that the gender of the CEO was significantly associated with the level of adoption of E-commerce, while the age and level of education of the CEO did not show any significant association. This study is supported by the findings of Venkatash and Morris (2000).

For convenience, these studies are summarised in Table 7.

Table 7: Business characteristics affecting the adoption of E-commerce by SMEs

BUSINESS CHARACTERISTICS	REPORTED BY
Business size	Hawkins et al (1995) Hawkins & Winter (1996) Hyland & Matlay (1997) Fallon & Moran (2000) Blackburn & Athayde (2000) Matlay (2000)
Business age	Kai-Uwe Brock (2000) MacGregor et al (2002) Donckels & Lambrecht (1997)
Business sector	Matlay 2000 MacGregor et al (2002) Schindehutte & Morris (2001) BarNir & Smith (2002) Blackburn & Athayde 2000
Market focus	Blackburn & Athayde (2000) Schindehutte & Morris (2001) BarNir & Smith (2002)
Level of IT skill in the organisation	Tetteh & Burn (2001) O'Donnell et al (2001)

The research studies presented above provide the context for a study of E-commerce adoption in SMEs in Karlstad (Sweden) and Wollongong (Australia). This study will be described next.

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2.8 Methodology

2.8.1 Choice of Location for Data Gathering

The study was primarily concerned with small businesses located in regional areas. Sweden and Australia were chosen to carry out the study for several reasons. Both countries have a large number of small businesses located in regional areas and the governments of both countries are keen to promote E-commerce adoption by small businesses in these areas. Furthermore, both Sweden and Australia are classified by the World Bank Group as high income nations and members of the Organisation for Economic Co-operation and Development (OECD). Finally, ease of access to small businesses in regional areas of the two countries was a major contributing factor.

2.8.2 Survey Instrument

A survey instrument was developed and distributed to SMEs in Karlstad (in 2001) and in Wollongong (in 2003). A total of 1170 surveys were distributed by post to randomly selected small businesses in Karlstad, and 161 surveys were administered by telephone in Wollongong. The mode of the data collection was selected based on previous research by de Heer (1999) which indicated that Scandinavian countries (including Sweden) had historically high survey response rates (although he notes that this is declining), while Australia had a higher nonresponse rate. Therefore, a low cost mail survey was used in Sweden, while the more expensive mode of phone surveys was used in Australia to ensure higher levels of participation.

The survey questions were based on previous research studies (described above) and asked respondents about their business and characteristics (size, age, business sector, market focus, level of IT skill, etc.), as well as their adoption and use of E-commerce. The data collected for each respondent is shown in Table 8. The data collected was analysed using SPSS software.

Table 8: Data collected for each respondent

SURVEY QUESTIONS	POSSIBLE RESPONSES
Business size	0 employees (sole proprietor) 1-9 employees 10-19 employees 20-50 employees More than 50 employees
Business age	Less than 1 year 1-2 years 3-5 years 6-10 years 11-20 years Over 20 years
Business sector	Industrial Service Retail Trading Financial
Market focus	Local area Regional area National International

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SURVEY QUESTIONS	POSSIBLE RESPONSES
Level of IT skill	No computer skill Low computer skill Normal computer skill High computer skill Expert computer skill
Annual turnover	Less than \$100,000 \$100,000 - \$500,000 \$500,001 - \$1,000,000 \$1,000,001 - \$2,000,000 More than \$2,000,000
Business type	Sole Proprietor Partnership Incorporated Company
Gender of primary owner/manager	Female/Male
Age of primary owner/manager	Under 21 years 21 – 30 yrs 31 – 40 yrs 41 – 50 yrs 51 – 60 yrs Over 60 years
Qualification of owner/manager	Primary School High School/HSC Trade qualifications Undergraduate degree Postgraduate degree PhD None
E-commerce adoption	Yes/No
Membership of strategic alliance/network	Yes/No

For those SMEs that had adopted E-commerce, respondents were asked to rate the applicability of the following **criteria for E-commerce adoption** on a scale of 1 to 5 (1 being not at all applicable to my situation and 5 being very applicable to my situation):

- Demand/pressure from customers
- Pressure of competition
- Pressure from suppliers
- Reduction of costs
- Improvement to customer service
- Improvement in lead time
- Increased sales
- Improvement to internal efficiency
- Strengthen relations with business partners
- Reach new customers/markets
- Improve competitiveness
- External technical support
- Improve marketing
- Improve control and follow-up

For those SMEs that had adopted E-commerce, respondents were asked to rate the applicability of the following **benefits of E-commerce adoption** on a scale of 1 to 5 (1 being not at all applicable to my situation and 5 being very applicable to my situation):

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- Lower administration costs
- Lower production costs
- Reduced lead time
- Reduced stock
- Increased sales
- Increased internal efficiency
- Improved relations with business partners
- New customers and markets
- Improved competitiveness
- Improved marketing
- Improved quality of information

For those SMEs that had adopted E-commerce, respondents were asked to rate the applicability of the following **disadvantages E-commerce adoption** on a scale of 1 to 5 (1 being not at all applicable to my situation and 5 being very applicable to my situation):

- Deterioration of relations with business partners
- Higher costs
- Computer maintenance
- Doubling of work
- Reduced flexibility of work
- Security
- Dependence on E-commerce

For those SMEs that had NOT adopted E-commerce, respondents were asked to rate the applicability of the following **barriers to E-commerce adoption** on a scale of 1 to 5 (1 being not at all applicable to my situation and 5 being very applicable to my situation):

- E-commerce doesn't fit with products/services
- E-commerce doesn't fit with the way we do business
- E-commerce doesn't fit the way our customers work
- We don't see the advantage of using E-commerce
- Lack of technical know how
- Security risks
- Cost too high
- Not sure what to choose

The results of the study are reported in the following chapters. Chapter 3 describes the profiles of the respondents. Chapter 4 presents the results for SMEs that have adopted E-commerce, while Chapter 4 describes the results for those SMEs that have not adopted E-commerce.

Chapter 3

Respondents' Profiles

3.1 Wollongong Respondents – Business Profile

There were 161 respondents in Wollongong, with the following characteristics:

Business Size

88.2% of the respondents had less than 10 employees, with 22% being sole proprietors (small businesses with no employees).

Business Age

50% of the Wollongong respondents indicated that they had been in business for over 10 years and 82.6% of the respondents had been in business for more than 2 years.

Business Sector

The single largest business sector was the service sector (49.6% of respondents), followed by the retail sector (41.6%). Despite Wollongong having a tradition of being an industrial city, only 6.8% of the respondents indicated that they were involved in an industrial-based small business.

Market Focus

Only one respondent indicated that they were involved with a largely international customer base. The majority of respondents (66.5%) indicated that they were dealing with a regional customer base. Not only were the responses to internationally focused businesses lower than expected, but the data showed that only 4.9% of the respondents considered their business to be nationally focused.

Annual Turnover

The data showed that 87.6% of the respondents had a turnover of less than \$1 million per annum. 29.8% of the respondents indicated that they were part of some form of strategic alliance. 39.4% of the respondents indicated that their business was sole proprietor, while 30.6% of businesses were partnerships and 28.8% were an incorporated company.

Owner/Manager Profile

- 36% of the Wollongong respondents' owners/managers were female
- 24.4% of respondents' owners/managers were aged between 31 and 40, 34.4% between 41 and 50, and 24.4% between 51 and 60.
- 27.4% of the respondent population had completed and graduated from university, 29.8% had a TAFE qualification, 22.4% had completed their Higher School Certificate, while 19.9% had not completed high school.

Other Interesting Results

- Male SME owner/managers are more likely to enter into partnerships than females (18% vs. 2%)
- Male SME owner/managers rated their IT expertise substantially higher than females (78% of males said that their IT skill level was above average, compared to 40% females respondents)
- The older the owner/manager, the more qualified they were
- Younger owner/managers (< 21 years) and very old owner managers (>60 years) are more likely to avoid partnerships and incorporated companies. The other age groups are equivocal regarding these.
- Very young owner/managers (<21 years) are less likely to use computers in their business, than older owner/managers.

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- The highest concentration of respondents indicating their IT knowledge was low or non-existent was the 21-40 age group.
- Respondents that had not completed their HSC or any other qualification were less likely to conduct business outside the local area.
- The higher the qualification of the owner/manager, the higher the reported turnover.
- The higher the qualification of the owner/manager, the longer the business had been operating

3.2 Karlstad Respondents – Business Profile

There were 313 respondents in Karlstad, with the following characteristics:

Business Size

70.3% of the respondents had less than 10 employees, with 17.9% being sole proprietors (small businesses with no employees).

Business Age

70.6% of the Karlstad respondents indicated that they had been in business for over 10 years.

Business Sector

The single largest business sector was the service sector (38.7% of respondents), followed by the financial sector (31.6%). It is interesting to note that despite the view of many researchers that small business is basically service and retail, the smallest group of respondents was retail (21.1%).

Market Focus

12.5% of respondents indicated that they were involved with a largely international customer base. The majority of respondents (57.5%) indicated that they were dealing with a local customer base. 44.1% of respondents indicated that their customer base was primarily either national or international. The lowest group was the regional respondents (11.1%).

Owner/Manager Profile

- 13% of the Karlstad respondents were female
- 68.3% of respondents were aged between 41 and 60
- 24.6% of the respondent population had only completed junior high school, 42.8% had completed senior high school, and 32.6% had completed the equivalent of TAFE or university.

Other Interesting Results

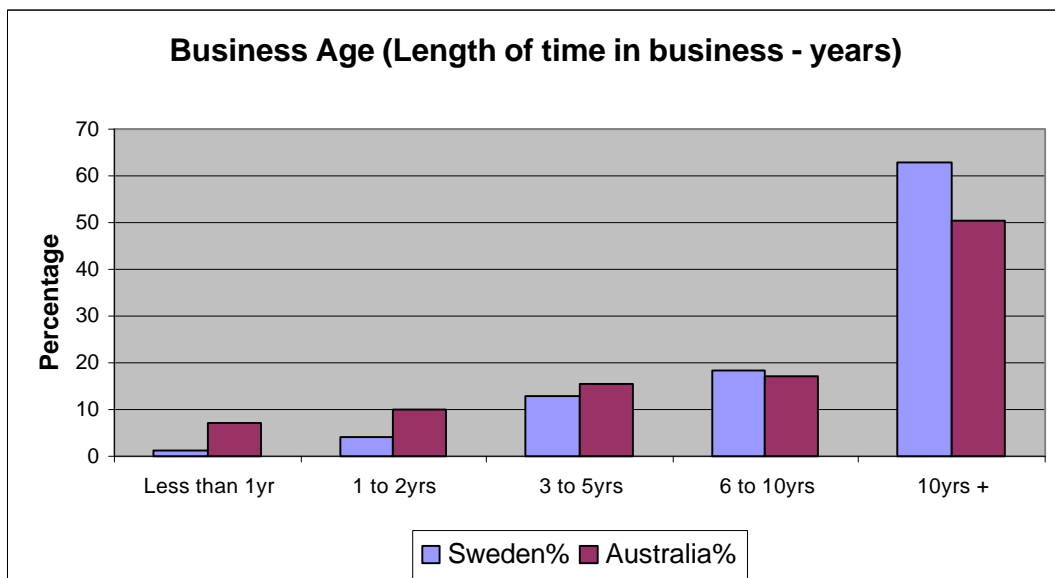
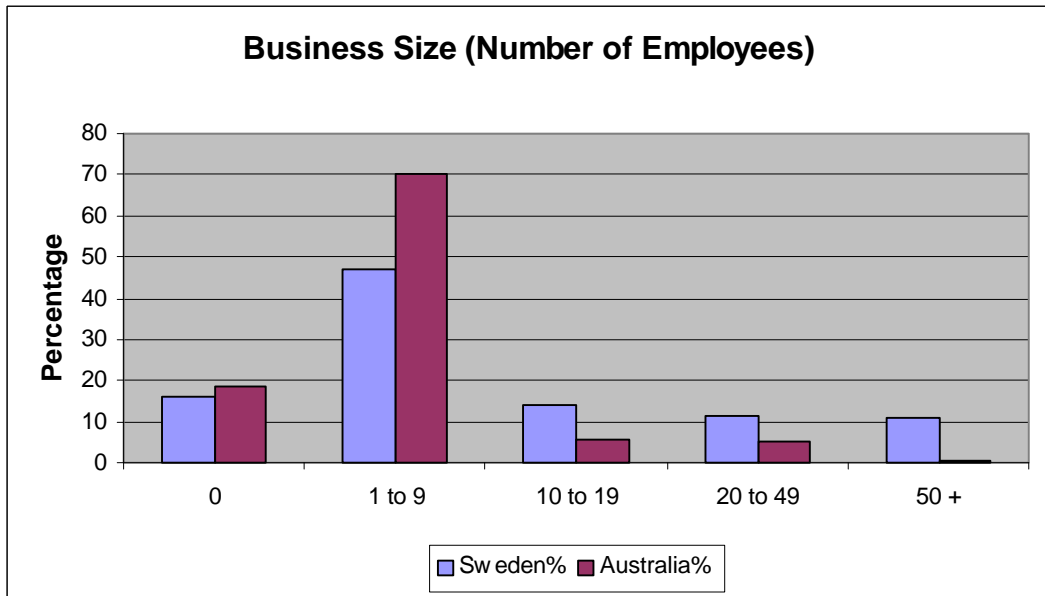
- Male owner/managers tended to stay in business longer than female owner/managers
- Female owner/managers tended to employ less staff than male owner/managers
- Over 70% of the female owner/managers were over 40 years of age, compare with 50% for males
- Female owner/managers tended to conduct business at a local level, male owner/managers focused on national and international markets.
- Owner/managers that are between 40 and 60 are more likely to hire staff than any other age group.
- Older businesses tend to have larger staff levels than newer businesses
- Service-based SMEs are usually older than other types of SMEs
- Service-based SMEs tend to have smaller staff levels than other types of SMEs
- Smaller SMEs tend to 'gravitate' towards some form of small business strategic alliance than their larger counterparts.
- Larger SMEs are more likely to have been using computer technology longer than smaller SMEs.
- Larger SMEs tend to rate their IT ability higher than smaller SMEs.
- The financial sector tends to report the use of computers in their day-to-day activities for greater lengths of time than any other SME group.
- The financial sector tends to report a greater ability with IT than any other SME group.

E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)

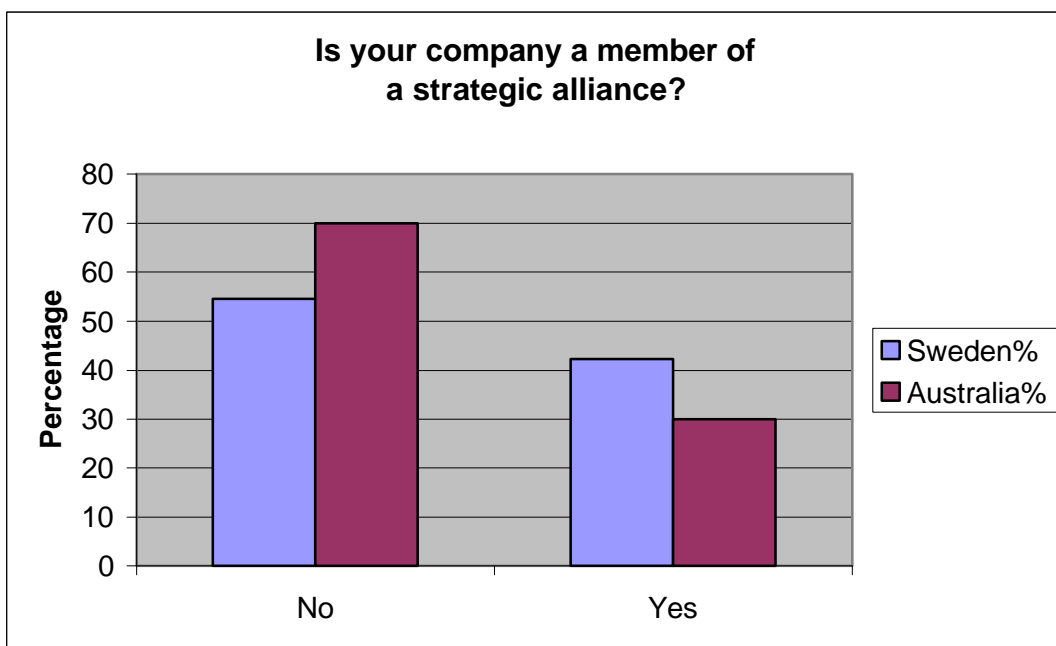
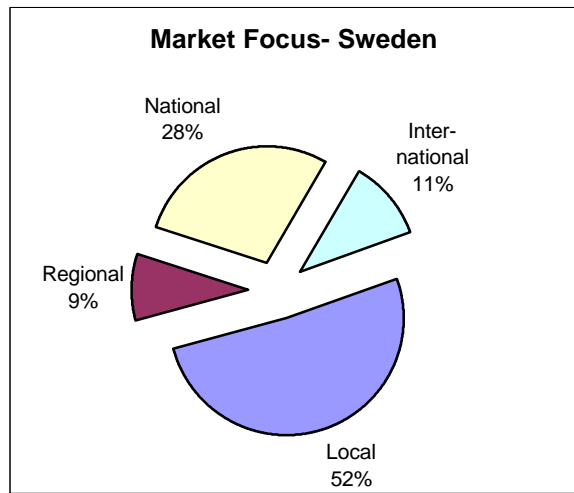
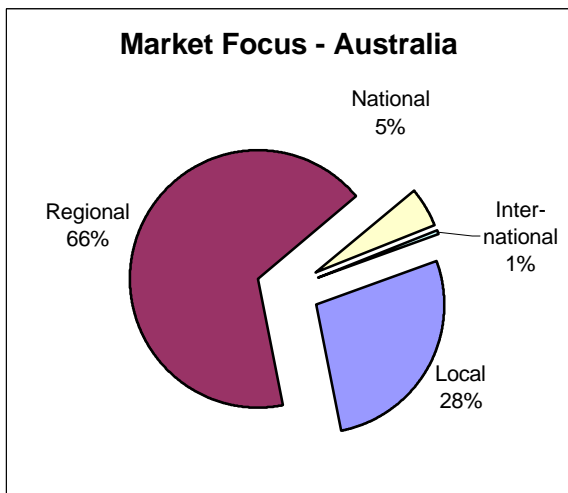
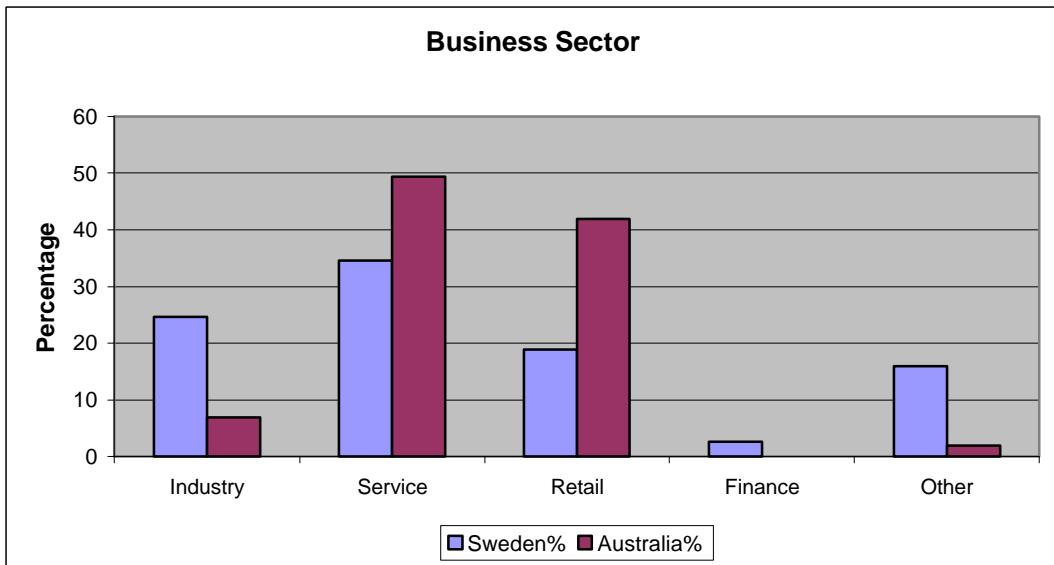
- The national market focused respondents report a higher level of IT knowledge than any other market focus group.

3.3 Wollongong and Karlstad – A Comparison of Business Profiles

The following graphs highlight the differences between the respondents in Wollongong and Karlstad.



E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)



E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)

3.4 Wollongong Respondents – IT Profile

Length of Time Using Computers

60.6% of respondents had been using computers for more than 2 years, with 23.1% of respondents indicating that they had been using computers for more than 10 years.

Level of IT skill

23.8% rated their IT skill above average, while 25.6% rated their skill as below average.

IT Support

18.9% of respondents did not have anyone (internally or externally) dedicated to providing IT support. The majority (44.4%) indicated that they used outside consultants to handle their computing requirements.

Internet Access

43.1% indicated that they used a dial-up facility, 6.3% used ISDN, 15.0% used ADSL, while 25.5% did not have any form of internet into their business.

Web Site

Only 35% of respondents indicated that they had developed a web site.

E-Commerce

Only 15.6% of respondents indicated they were using E-commerce.

It should be noted that there was no association between the level of skill of the respondent organisation, or the length of time computers had been used with either the existence of a web site or the use of E-commerce.

Other Interesting Results

- 89.2% of the female respondents rely on contractors to handle their computing needs. By comparison, only 60% of males relied on contractors.
- Females rated their business's IT skill level significantly lower than males
- Only 25.9% of SMEs with female owner/managers had web site. By comparison, 47% of SMEs with male owner/managers had web sites.
- Older owner/managers are more likely to have been using computer technology in their businesses for greater lengths of time than younger owner/managers. Yet, younger owner/managers rate their ability higher than older managers, despite the fact they have far longer business experience with them
- Larger SMEs are more likely to have web sites than smaller SMEs
- Larger SMEs are more likely to be involved with E-commerce than smaller SMEs
- Higher qualified owner/managers tend to use, and have been using computer technology for longer than less qualified owner/managers
- Higher qualified owner/managers tend to rely on outside contractors more than less qualified owner/managers
- Higher qualified owner/managers have developed web sites, less qualified owner/managers are at best equivocal regarding web site development.
- 71% of sole proprietors used some form of computing in their day-to-day business activities. By comparison, 98% of incorporated companies used some form of computing in their day-to-day business activities.
- 32.3% of sole proprietors have a full time employee responsible for the computing. By comparison, 25% of incorporated companies and 12.5% of partnership have a full time employee responsible for the computing.
- Respondents who were in some form of partnership rated their IT skill level than those respondents who were either sole proprietors or incorporated companies.
- SMEs that rate their IT skill as high are more likely to develop web sites

E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)

- Respondents that are nationally focused are more likely to develop E-commerce than any other market focus group.
- Members of a strategic alliance are more likely to develop a web site.

3.5 Karlstad Respondents – IT Profile

Length of Time Using Computers

83.4% of respondents had been using computers for more than 2 years, with 40.9% of respondents indicating that they had been using computers for more than 10 years.

Level of IT skill

73.7% rated their IT skill above average, while 13.7% rated their skill below average.

IT Support

18.0% of respondents did not have anyone (internally or externally) dedicated to providing IT support. The majority (60.9%) indicated that they used their own staff to handle their IT support.

Web Site

65% of respondents indicated that they had developed a web site.

E-Commerce

52.3% of respondents indicated they were using E-commerce.

It should be noted that there was a strong association between the level of skill, the length of time using computer technology and the use of web-sites and E-commerce.

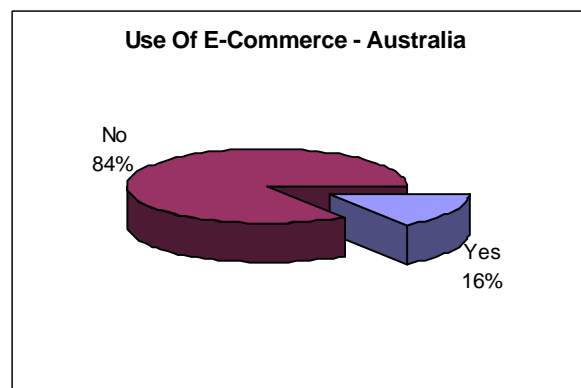
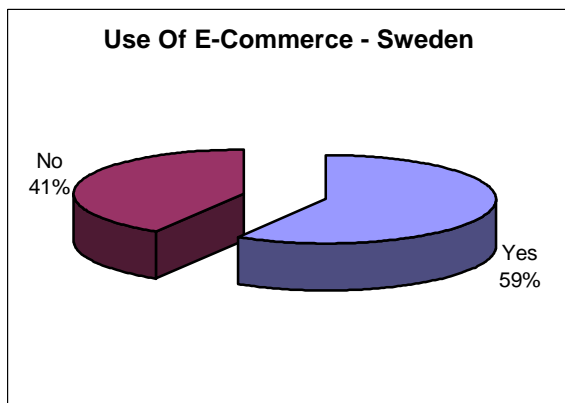
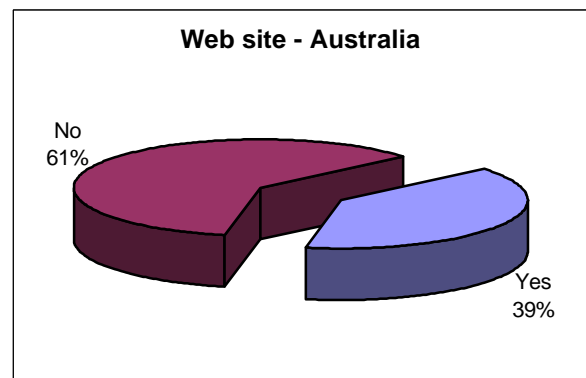
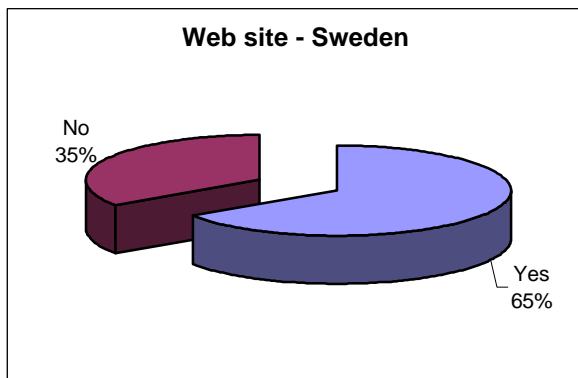
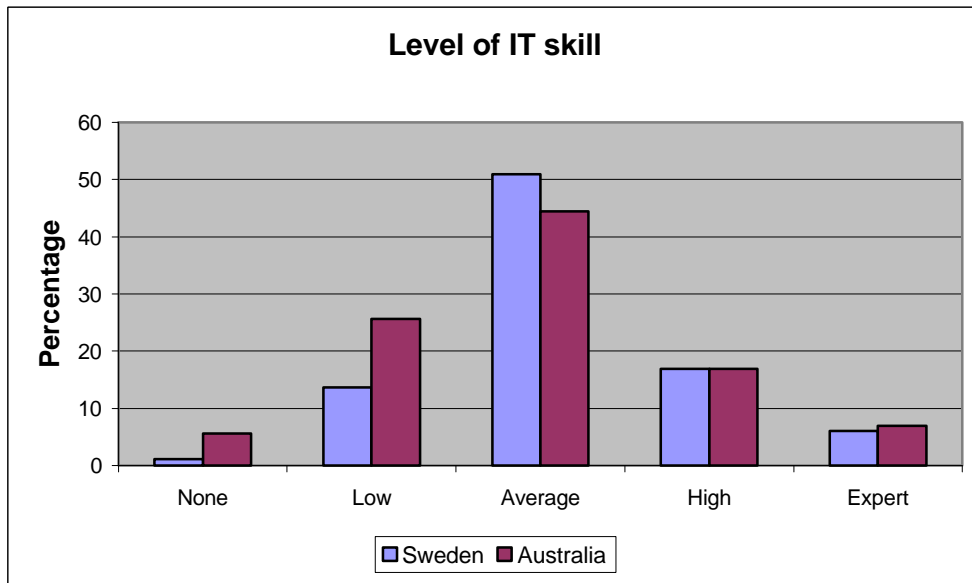
Other Interesting Results

- Computers have been used for longer in businesses with a national or international market focus
- Computers have been used in service and financial sectors than any other sector
- Businesses with a national market focus rated their computer skill level higher than any other market focus group.
- Larger SMEs rated their computer skill levels higher than smaller SMEs
- Larger SMEs are more likely to have web sites than smaller SMEs
- SMEs that rate their IT skill as high are more likely to develop web sites
- SMEs that rate their IT skill as high are more likely to develop E-commerce
- SMEs that have been in business for longer are more likely to resist developing a web site
- Financially and Industrially based SMEs are more likely to have web sites.
- Financially and Industrially based SMEs are more likely to have developed E-commerce
- Non members of a strategic alliance are more likely to develop a web site
- Non members of a strategic alliance are more likely to develop E-commerce

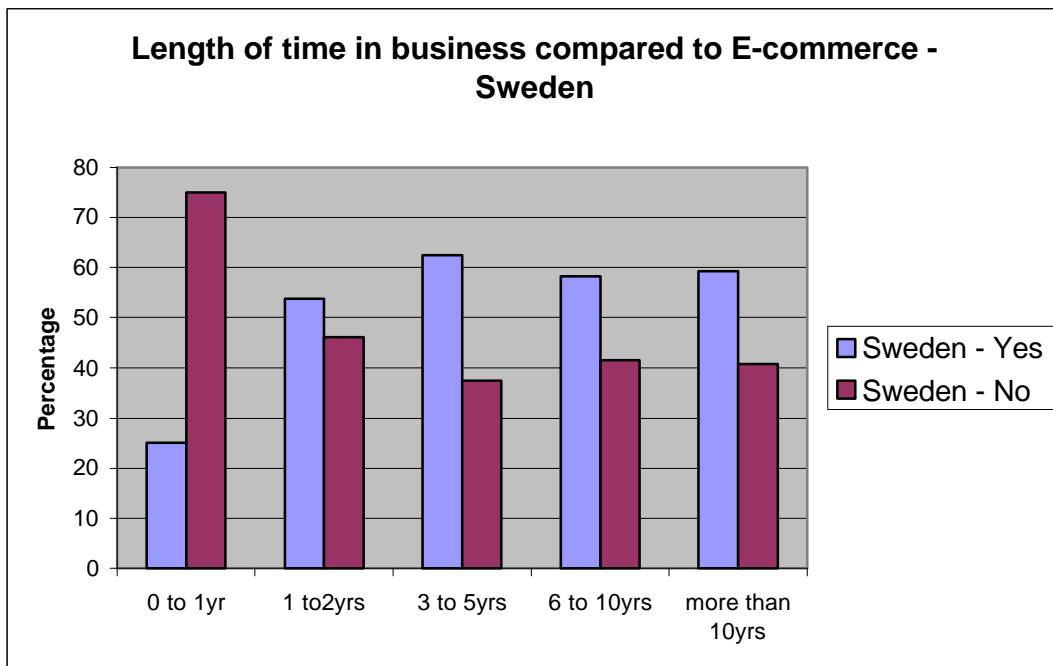
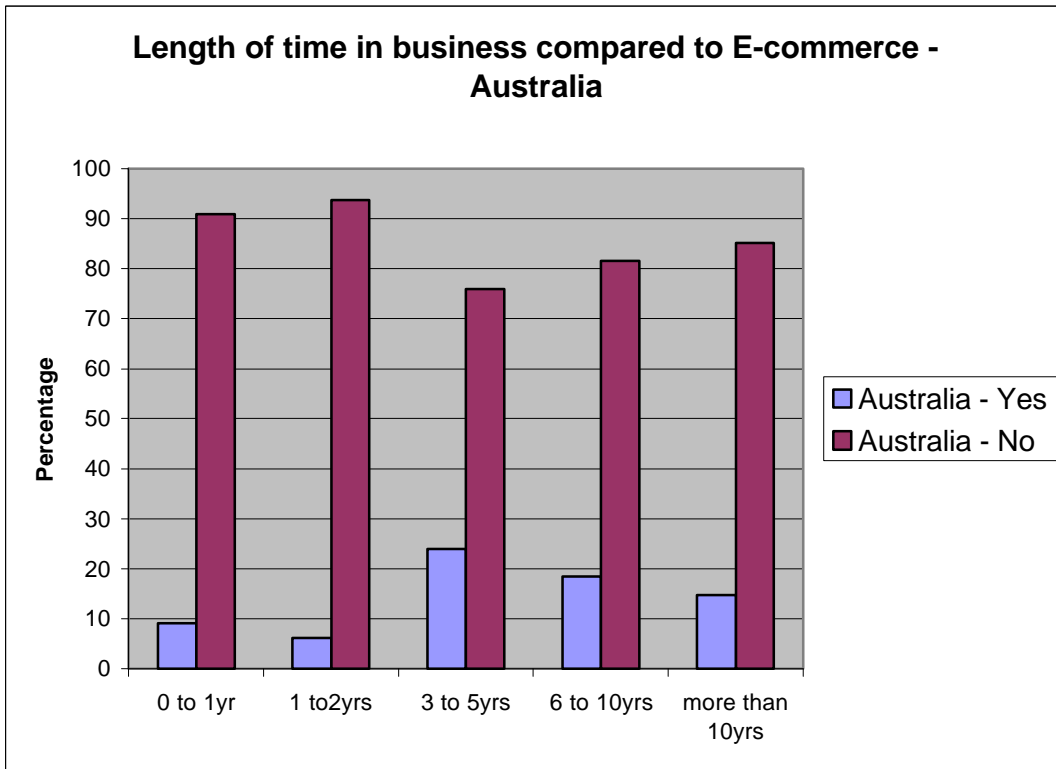
3.6 Wollongong and Karlstad – A Comparison of IT Profiles

The following graphs highlight the IT differences between the respondents in Wollongong and Karlstad.

E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)



E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)



Chapter 4

E-Commerce Adopters

4.1 Wollongong

4.1.1 Criteria (Drivers) of E-Commerce Adoption

The following table indicates the responses to the question of “Why did your organisation adopt E-commerce?”. SMEs were provided with a list of reasons (criteria/drivers) and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 6 respondents (or 24% of respondents) indicated that “Demand/pressure from customers” was not applicable to their situation.

Criteria (Drivers)	1	%	2	%	3	%	4	%	5	%
Demand/pressure from customers	6	24	5	20	2	8	5	20	5	20
Pressure of competition	6	24	3	12	4	16	7	28	3	12
Demand/Pressure from suppliers	17	68	2	8	0	0	3	12	3	12
Reduction of costs	5	20	1	4	2	8	6	24	10	40
Improvement to customer service	2	8	2	8	3	12	8	32	9	36
Improvement in lead time	8	32	3	12	7	28	2	8	5	20
Increased sales	5	20	2	8	0	0	9	36	9	36
Improvement to internal efficiency	3	12	0	0	4	16	9	36	9	36
Strengthen relations with business partners	19	76	0	0	2	8	4	16	0	0
Reach new customers/markets	4	16	2	8	5	20	4	16	10	40
Improvement in competitiveness	5	20	0	0	3	12	8	32	9	36
External technical support	19	76	1	4	1	4	2	8	2	8
Improvement in marketing	4	16	2	8	4	16	8	32	7	28
Improvement in control and follow-up	4	16	2	8	5	20	8	32	6	24

An examination of the data in above table shows that for SMEs in Wollongong the most important criterion for adopting E-commerce was **increased sales** (a total rating of 72% at the 4 and 5 level).

Other findings regarding criteria include the following:

- Male owner/managers are more concerned with *Improvement in competitiveness* than female owner/managers.

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- Owner/managers under 20 years of age and above 60 years of age are more concerned with *Improvement to customer service* and *Reaching new customers/markets* than any other age group.
- Owner/managers with High School or TAFE qualifications are more concerned with *Reaching new customers/markets* than any of the other qualification groups.
- Larger SMEs are more concerned with *Improvement to internal efficiency* than smaller SMEs.
- SMEs that have been in business for more than 5 years are more concerned with *Demand/pressure from customers*, *Reduction of costs*, *Improvement to customer service*, *Increased sales* and *Improvement in control and follow-up* than are SMEs that have been in business for less than 5 years.
- SMEs that indicated that they had a high level of IT skill are more concerned with *Improvement to customer service* than SMEs with an average or low level of IT skill.
- Service based SMEs are more concerned with *Reduction of costs*, *Improvement to customer service*, *Increased sales*, *Improvement to internal efficiency* and *Improvement in control and follow-up* than any of the other sectors.

4.1.2 Benefits of E-Commerce Adoption

The following table indicates the responses to the question of “What benefits did your organisation experience after adopting E-commerce?”. SMEs were provided with a list of benefits and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 4 respondents (or 16% of respondents) indicated that “Lower administration costs” was not applicable to their situation.

Benefits	1	%	2	%	3	%	4	%	5	%
Lower administration costs	4	16	4	16	3	12	9	36	5	20
Lower production costs	11	44	3	12	4	16	4	16	3	12
Reduced lead time	11	44	1	4	5	20	5	20	3	12
Reduced stock	13	52	3	12	3	12	4	16	2	8
Increased sales	6	24	5	20	5	20	6	24	3	12
Increased internal efficiency	4	16	0	0	3	12	11	44	7	28
Improved relations with business partners	21	84	0	0	2	8	1	4	1	4
New customers and markets	8	32	1	4	5	20	5	20	6	24
Improved competitiveness	5	20	2	8	5	20	6	24	7	28
Improved marketing	4	16	1	4	8	32	5	20	7	28
Improved quality of information	6	24	1	4	7	28	4	16	7	28

An examination of the data in above table shows that for SMEs in Wollongong the most important benefit of adopting E-commerce was **increased internal efficiency** (a total rating of 72% at the 4 and 5 level).

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Other findings regarding benefits include the following:

- Female owner/managers rated the benefit *Increased internal efficiency* higher than male owner/managers.
- Owner/managers over the age of 50 rated the benefits *Increased sales* and *Increased internal efficiency* as more important than any other age group.
- Owner/managers with a High School or TAFE qualification rated the benefit *Improved marketing* more important than any other qualification group.

4.1.3 Disadvantages of E-Commerce Adoption

The following table indicates the responses to the question of “What disadvantages did your organisation experience after adopting E-commerce?”. SMEs were provided with a list of disadvantages and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 23 respondents (or 92% of respondents) indicated that “Deterioration of relations with business partners” was not applicable to their situation.

Disadvantages	1	%	2	%	3	%	4	%	5	%
Deterioration of relations with business partners	23	92	1	4	1	4	0	0	0	0
Higher costs	11	44	5	20	3	12	4	16	2	8
Computer maintenance	6	24	1	4	2	8	7	28	9	36
Doubling of work	12	48	3	12	5	20	3	12	2	8
Reduced flexibility of work	12	48	6	24	16	32	3	12	0	0
Security	6	24	6	24	6	24	6	24	1	4
Dependence on E-commerce	8	32	5	20	2	8	3	12	7	28

An examination of the data in above table shows that for SMEs in Wollongong the most important disadvantage of adopting E-commerce was **computer maintenance** (a total rating of 64% at the 4 and 5 level).

Other findings regarding disadvantages include the following:

- Female owner/managers considered *Reduced flexibility of work* to be more of a problem than male owner/managers.
- Owner/managers with average to below average IT skill levels considered *Security* to be more of a disadvantage than those that had a higher level of IT skill.

E-Commerce in Adoption in SMEs: A Comparative Study of Wollongong (Australia) and Karlstad (Sweden)

4.2 Karlstad

4.2.1 Criteria (Drivers) of E-Commerce Adoption

The following table indicates the responses to the question of “Why did your organisation adopt E-commerce?”. SMEs were provided with a list of reasons (criteria/drivers) and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 54 respondents (or 41.5% of respondents) indicated that “Demand/pressure from customers” was not applicable to their situation.

Criteria (Drivers)	1	%	2	%	3	%	4	%	5	%
Demand/pressure from customers	54	41.5	33	25.4	19	14.6	19	14.6	5	3.8
Pressure of competition	39	30.2	21	16.3	36	27.9	24	18.6	9	7.0
Demand/Pressure from suppliers	64	51.2	23	18.4	20	16.0	14	11.2	4	3.2
Reduction of costs	16	12.4	14	10.9	30	23.3	41	31.8	28	21.7
Improvement to customer service	6	4.7	1	0.8	19	14.7	44	34.1	59	45.7
Improvement in lead time	35	27.8	14	11.1	25	19.8	31	24.6	21	16.7
Increased sales	19	15.0	14	11.0	33	26.0	29	22.8	32	25.2
Improvement to internal efficiency	8	6.1	3	2.3	21	15.9	59	44.7	41	31.1
Strengthen relations with business partners	17	13.2	13	10.1	39	30.2	40	31.0	20	15.5
Reach new customers/markets	17	13.3	11	8.6	30	23.4	36	28.1	34	26.6
Improvement in competitiveness	15	11.5	4	3.1	19	14.6	50	38.5	42	32.3
External technical support	85	66.9	26	20.5	10	7.9	3	2.4	3	2.4
Improvement in marketing	20	15.6	8	6.3	20	15.6	43	33.6	37	28.9
Improvement in control and follow-up	24	18.8	20	15.6	38	29.7	29	22.7	17	13.3

An examination of the data in above table shows that for SMEs in Karlstad the most important criterion for adopting E-commerce was **improvement to customer services** (a total rating of 79.8% at the 4 and 5 level).

Other findings regarding criteria include the following:

- Female owner/managers are less concerned with *Pressure of competition*, *Reach new customers/markets* and *Increased sales* than male owner/managers.
- Female owner/managers are more concerned with *Improvement in competitiveness* and *Improvement in marketing* than are male owner managers.

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- Older SMEs are more concerned with *Improvement in competitiveness* than SMEs that have been in business for a lesser time period.
- Larger SMEs are more concerned with *Demand/pressure from customers, Reduction of costs, Improvement in lead time, Increased sales, Strengthening relations with business partners, Reaching new customers/markets, Improvement in competitiveness, External technical support* and *Improvement in marketing* than smaller SMEs.
- SMEs from the financial sector are more concerned with *Demand/pressure from customers, Pressure of competition* and *Increased sales* than any of the other business sectors.

4.2.2 Benefits of E-Commerce Adoption

The following table indicates the responses to the question of “What benefits did your organisation experience after adopting E-commerce?”. SMEs were provided with a list of benefits and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 18 respondents (or 13.7% of respondents) indicated that “Lower administration costs” was not applicable to their situation.

Benefits	1	%	2	%	3	%	4	%	5	%
Lower administration costs	18	13.7	23	17.6	37	28.2	31	23.7	22	16.8
Lower production costs	27	21.1	22	17.2	27	21.1	34	26.6	18	14.1
Reduced lead time	25	19.5	12	9.4	29	22.7	40	31.3	22	17.2
Reduced stock	52	43.0	14	11.6	32	26.4	14	11.6	9	7.4
Increased sales	22	17.3	27	21.3	33	26.0	34	26.8	11	8.7
Increased internal efficiency	20	15.6	11	8.6	9	7.0	31	24.2	57	44.5
Improved relations with business partners	16	12.5	16	12.5	43	33.6	40	31.3	13	10.2
New customers and markets	20	15.7	24	18.9	32	25.2	33	26.0	18	14.2
Improved competitiveness	11	8.4	18	13.7	34	26.0	47	35.9	21	16.0
Improved marketing	48	37.2	29	22.5	27	20.9	15	11.6	10	7.8
Improved quality of information	17	13.2	13	10.1	27	20.9	37	28.7	35	27.1

An examination of the data in above table shows that for SMEs in Karlstad the most important benefit of adopting E-commerce was **increased internal efficiency** (a total rating of 68.7% at the 4 and 5 level).

Other findings regarding benefits include the following:

- Female owner/managers rated the benefit *Increased sales* as being less important than their male counterparts.
- SMEs with staff levels between 1 and 19 rated the benefits *Lower production cost, Reduced lead time, Increased internal efficiency, New customers and markets, Improved competitiveness* and *Improved marketing* as being more important than SMEs that were sole traders or that had over 20 employees.

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- Both industrial and financial sector SMEs rated the benefit *Lower production costs* as being more important than any of the other sectors.

4.2.3 Disadvantages of E-Commerce Adoption

The following table indicates the responses to the question of "What disadvantages did your organisation experience after adopting E-commerce?". SMEs were provided with a list of disadvantages and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 90 respondents (or 70.9% of respondents) indicated that "Deterioration of relations with business partners" was not applicable to their situation.

Disadvantages	1	%	2	%	3	%	4	%	5	%
Deterioration of relations with business partners	90	70.9	20	15.7	15	11.8	1	0.8	1	0.8
Higher costs	53	41.4	28	21.9	30	23.4	12	9.4	5	3.9
Computer maintenance	31	24.2	35	27.3	40	31.3	18	14.1	4	3.1
Doubling of work	52	40.9	42	33.1	18	14.2	12	9.4	3	2.4
Reduced flexibility of work	92	72.4	22	17.3	11	8.7	2	1.6	0	0.0
Security	77	60.6	28	22.0	16	12.6	5	3.9	1	0.8
Dependence on E-commerce	61	48.8	25	20.0	32	25.6	5	4.0	2	1.6

An examination of the data in above table shows that for SMEs in Karlstad the most important disadvantage of adopting E-commerce was considered to be **computer maintenance** (a total rating of 17.2% at the 4 and 5 level). However, the low percentage indicates that this disadvantage was not considered to be important by a majority of respondents.

This is a very unexpected finding from the Karlstad study that raises some important questions concerning the validity of popularly cited disadvantages from E-commerce adoption. An examination of much of the literature concerned with disadvantages derived from E-commerce adoption tends to treat them as 'universal' to the entire SME sector. Clearly, this view is not supported by the Karlstad data.

Other findings regarding disadvantages include the following:

- SMEs that had between 1 and 19 employees rated *Deterioration of relations with business partners*, *Higher costs*, *Doubling of work* and *Reduced flexibility of work* to be greater disadvantages than SMEs that had no employees or SMEs that had more than 20 employees.

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4.3 Wollongong and Karlstad – A Comparison

Four criteria (drivers) were statistically significantly different between the two populations. These were:

- Demand/pressure from customers
- Increased sales
- Strengthen relations with business partners
- Improvement in control and follow-up

The Australian respondents rated *Demand/pressure from customers*, *Increased sales* and *Improvement in control and follow-up* to be more important. The Swedish respondents considered *Strengthening relations with business partners* to be of more importance than the Australian respondents.

Two benefits were statistically significantly different between the two populations. These were:

- New customers and markets
- Improved quality of information

Swedish respondents considered *New customers and markets* a greater benefit than did the Australian respondents. By comparison, Australian respondents rated *Improved quality of information* as being more important than the Swedes.

Three disadvantages were statistically significantly different between the two populations. These were:

- Deterioration of relations with business partners
- Doubling of work
- Security

Swedish respondents rated *Deterioration of relations with business partners* and *Doubling of work* as more of a disadvantage than did the Australian respondents. By comparison, the Australians were more concerned with *Security* than the Swedish respondents.

Chapter 5

E-Commerce Non-Adopters

5.1 Wollongong

5.1.1 Barriers to E-Commerce Adoption

The following table indicates the responses to the question of “Why has your organization NOT adopted E-commerce?”. SMEs were provided with a list of reasons (barriers) and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 25 respondents (or 18.5% respondents) indicated that “E-commerce doesn’t fit with products/services” was not applicable to their situation.

Barriers	1	%	2	%	3	%	4	%	5	%
E-commerce doesn't fit with products/services	25	18.5	17	12.6	29	21.5	18	13.3	46	34.1
E-commerce doesn't fit with the way we do business	17	12.7	20	14.9	25	18.7	28	20.9	44	32.8
E-commerce doesn't fit the way our customers work	21	15.7	18	13.4	29	21.6	25	18.7	41	30.6
We don't see the advantage of using E-commerce	18	13.3	22	16.3	33	24.4	20	14.8	42	31.1
Lack of technical know how	28	20.7	31	23.0	12	8.9	18	13.3	46	34.1
Security risks	29	21.5	25	18.5	40	29.6	13	9.6	28	20.7
Cost too high	31	23.0	31	23.0	18	13.3	22	16.3	33	24.4
Not sure what to choose	36	26.7	29	21.5	27	20.0	16	11.9	27	20.0

An examination of the data in above table shows that for SMEs in Wollongong the most important barrier inhibiting organisations from adopting E-commerce was **e-commerce doesn't fit with the way we do business** (a total rating of 53.7% at the 4 and 5 level).

Other findings regarding barriers include the following:

- Female owner/managers rated the barrier *Security risks* as more important than male owner/managers.
- Female owner/managers rated the barrier *Not sure what to choose* as more important than male owner/managers.
- Owner/managers that were over 40 years of age rated the barrier *Not sure what to choose* as more important than those that were under 40 years of age.

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- Owner/managers without qualifications rated the barrier *E-commerce doesn't fit with products/services* as more important than those with formal qualifications.
- Owner/managers without qualifications rated the barrier *Lack of technical know how* as more important than those with formal qualifications.
- Owner/managers without qualifications rated the barrier as *Not sure what to choose* more important than those with formal qualifications.
- SMEs that had less than 10 employees rated the barrier *Not sure what to choose* as more important a reason for non-adoption of E-commerce than SMEs that had more than 10 employees.
- SMEs that were not members of any form of small business strategic alliance tend to rate the barrier *E-commerce doesn't fit with products/services* as more important than SMEs that were members of small business strategic alliance.
- The level of IT knowledge and skill was a determining factor in the rating of several barriers. These were *Lack of technical know how*, *Security risks*, *Cost too high* and *Not sure what to choose*.
- Locally focused SMEs tended to rate the barriers *Lack of technical know how* and *Security risks* as less important than those who were regionally or nationally focused.

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5.2 Karlstad

5.2.1 Barriers to E-Commerce Adoption

The following table indicates the responses to the question of “Why has your organization NOT adopted E-commerce?”. SMEs were provided with a list of reasons (barriers) and asked to rate each one on a scale of 1 to 5 depending on how applicable it was to their situation (1 = not at all applicable; 5 = very applicable). The table below shows the number of responses for each rating and the corresponding percentages. For example, 14 respondents (or 14.6% of respondents) indicated that “E-commerce doesn’t fit with products/services” was not applicable to their situation.

Barriers	1	%	2	%	3	%	4	%	5	%
E-commerce doesn't fit with products/services	14	14.6	8	8.3	21	21.9	20	20.8	33	34.4
E-commerce doesn't fit with the way we do business	17	17.3	14	14.3	19	19.4	16	16.3	32	32.7
E-commerce doesn't fit the way our customers work	11	11.7	15	16.0	21	22.3	20	21.3	27	28.7
We don't see the advantage of using E-commerce	18	18.8	16	16.7	25	26.0	14	14.6	23	24.0
Lack of technical know how	16	16.7	12	12.5	22	22.9	20	20.8	26	27.1
Security risks	14	15.4	27	29.7	22	24.2	18	19.8	10	11.0
Cost too high	17	18.5	17	18.5	24	26.1	19	20.7	15	16.3
Not sure what to choose	16	18.0	11	12.4	28	31.5	13	14.6	21	23.6

An examination of the data in above table shows that for SMEs in Karlstad the most important barrier inhibiting organisations from adopting E-commerce was ***e-commerce doesn't fit with products/services*** (a total rating of 55.2% at the 4 and 5 level).

Other findings regarding barriers include the following:

- SMEs that have been in business for more than 10 years tend to rate the barrier *We don't see the advantage of using E-commerce* as more important than those that have been in business for a shorter period of time.
- The service sector tended to rate the barrier *E-commerce doesn't fit with products/services* as far more relevant a reason for non-adoption than any of the other sectors.
- The service sector tended to rate the barrier *E-commerce doesn't fit with the way we do business* as far more relevant a reason for non-adoption than any of the other sectors.
- The service sector tended to rate the barrier as far *Not sure what to choose* more relevant a reason for non-adoption than any of the other sectors.
- SMEs that were part of a small business strategic alliance tended to rate the barrier *We don't see the advantage of using E-commerce* as more important than SMEs that were not part of a small business strategic alliance.

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- SMEs that were part of a small business strategic alliance tended to rate the barrier *E-commerce doesn't fit with products/services* as more important than SMEs that were not part of a small business strategic alliance.
- Respondents who were over 40 years of age tended to rate the barrier *E-commerce doesn't fit the way our customers work* as more critical than those that were under 40 years of age.
- Respondents who were under 40 years of age tended to rate the barrier *Cost too high* as more critical than those that were over 40 years of age.

5.3 Wollongong and Karlstad – A Comparison

A comparison of the two groups showed that there was a statistically significant difference in the rating of all but one barrier between the Swedish and Australian SMEs: *Not sure what to choose*. In all cases, the Australian SMEs felt that this was a greater barrier to e-commerce adoption than their Swedish counterparts.

Of particular interest was the fact that the greatest differences were found in those barriers that had to do with the potential changes to working conditions of the SMEs or the SMEs' customers. Australian SMEs reported these barriers as being more important than the Swedish businesses. This has significant implications for the way in which e-commerce is perceived by Australian SMEs.

Chapter 6

Conclusion and Implications

The study presented in this report indicates that SMEs in Karlstad (Sweden) had progressed further in E-commerce adoption and use in 2001 than their counterparts in Wollongong (Australia) almost two years later. While the E-commerce adoption rate in Karlstad was 52.3%, in Wollongong it was 15.6%. SMEs in Wollongong still perceive E-commerce as being unsuited to the way they do business. This finding is particularly relevant to E-commerce adoption initiatives. It implies that SMEs need to be re-educated about the opportunities that E-commerce offers from a broader perspective that encompasses both internal and external benefits.

SMEs in both Wollongong and Karlstad that have adopted E-commerce report a number of beneficial outcomes as a result. The most significant of these is increased internal efficiency which translates into cost savings and streamlined business operations. Both groups of SMEs also report the same disadvantage: higher levels of computer maintenance. Clearly, SMEs that have adopted E-commerce require more IT support to ensure that they maximise the benefits of this technology.

Although the study presented in this report is by no means exhaustive, it does provide a useful insight into how SMEs perceive and use E-commerce. The sheer variety of findings reported makes it impossible to draw any broad conclusions about what needs to be done specifically to assist SMEs in E-commerce adoption in general. Indeed, if one broad conclusion can be made, then it's to say that no two SMEs are alike. However, by examining the individual results more closely, we are in a better position to develop E-commerce adoption strategies aimed at specific types of SMEs. It is critical to do so before we fall even further behind our European counterparts.

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