A taxonomy of e-adoption strategies in SMEs and rapid e-business strategy development

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A taxonomy of e-adoption strategies in SMEs and rapid e-business strategy development

by

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A thesis submitted in partial fulfilment for the requirements of the degree of Doctor of Philosophy at the University of Central Lancashire

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I declare that while registered as a candidate for the research degree, I have not been a registered candidate or enrolled student for another award of the University or other academic or professional institution

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Abstract

Recent research has shown that the use of e-business can provide an important advantage in today's competitive business environment and it is likely that not using e-business will be a disadvantage in the future. Recent research has also shown the need for a strategic approach when undertaking a new investment such as e-business. In this context, small and medium enterprises (SMEs) face special problems; they are often dependent on larger enterprises where they are suppliers of products (goods or services) or the buyers of products. They also tend to neglect strategies more than large enterprises and they cannot adopt the strategies of large enterprises because of their different situation. The literature review discovered that research in this area is deficient. While the subjects SME, e-business, and strategy are frequently covered in academic literature there is insufficient research available covering integration of all three subjects. The research available suggests that, although general models and frameworks exist, SMEs generally do not use these models and frameworks and even tend to neglect strategies, operate without strategies or do not have the time to develop a strategy: they are reactive rather than proactive, when making decisions.

For the first stage of the study a questionnaire was conducted with 1000 SMEs in the North West of England to find out more about the SMEs' e-business strategies. The analysis of the collected responses has corroborated the belief that many SMEs are neglecting e-business strategies and that they enter the e-business arena without careful planning. Moreover the data has indicated that the choice of strategic models, if any, is to a large extent confined to the use of one model. The data suggests that the SMEs can be grouped into five different clusters, according to their adoption of e-business technology and their use of general business and e-business strategies.

For the second stage 29 SMEs from the five different clusters were interviewed to find out more about their use of e-business technologies, their e-adoption and their use of business strategies and e-business strategies. The interviews found that old fashioned SMEs, blind e-business users, formal strategy leaders, e-adoption leaders and e-business strategy leaders were distinct groups whose existence can also be confirmed through the interviews. The knowledge gained form this stage, together with the findings from the quantitative survey were used to create a model addressing the need of SMEs to develop e-business strategies in a quick and easy way.

This work contributes to knowledge in the area of strategic management and information systems by providing a taxonomic classification of SMEs based on the dimensions of e-adoption, business strategy and e-business strategy and by providing a model that can help SMEs by allowing them to carry out suitable strategic analysis rapidly before undertaking an investment in e-business.

APPENDIX I   **Pilot questionnaire**

APPENDIX II   **Questionnaire letters**

APPENDIX III   **Main questionnaire**

APPENDIX IV   **Material sent with questionnaire**

APPENDIX V   **Interview instructions**

APPENDIX VI   **Letter for interviewee**

APPENDIX VII   **Pilot interview instructions**

APPENDIX VIII   **Instructions for main interview**

APPENDIX IX   **Dendrogram**

APPENDIX X   **Agglomeration Schedule**

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List of figures

List of tables

List of equations

List of abbreviations

AJAX	Asynchronous JavaScript and XML
APEC	Asia-Pacific Economic Cooperation
BERR	Department for Business, Enterprise and Regulatory Reform
BSD	Berkeley Software Distribution
CAA	Chartered Accountants and business Advisors
CAD	Computer Aided Drafting Company
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CMS	Content Management System
CNC	Computer Networks Company
CRM	Customer Relationship Management
CSV	Comma Separated Values
DBG	Distributor of Business Gifts and promotional items
EC	European Commission
EDI	Electronic Data Interchange
EDM	Engineering Distributors and Machine tool dealer
EFI	Electronic Form Interchange
EMC	Electronics Manufacturing Company
EU	European Union
FCR	Fish 'n' Chips Restaurant
GBC	General Building Contractors
GLF	Golf and Leisure Facility provider
HCS	Home Care Services
HHP	Holiday Home Park for caravans
HOT	Hotel
HTML	HyperText Markup Language
ICT	Information and Communication Technology
IDG	Importer and Distributor of Giftware
IS	Information System
IT	Information Technology
KDE	K Desktop Environment
MCR	Manufacturer of Closing Rings
MDA	Manufacturer of Dental Appliances
MFH	Maintenance business and Flying school for Helicopters

MIE	Manufacturer and Importer of Equestrian products
NHS	National Health Service
OECD	Organisation for Economic Co-operation and Development
PBM	Facilitator of Play-By-Mail games
PDC	Painting and Decorating Contractor
PDF	Portable Document Format
PEST	Political, Economic, Social, and Technological analysis
PHP	Personal Home Page
PSF	Producer of Synthetic Fibres
RFC	Regional Farmer Cooperative
RFP	Retailer of Fire Places
RNH	Registered Nursing Home
RRA	Regional Recruitment Agency
SARS	Severe Acute Respiratory Syndrome
SDS	Small Department Store
SLS	Solicitor Providing legal Services
SME	Small to Medium-sized Enterprises
SPSS	Statistical Package for the Social Sciences
STE	Shelter Time Employment provider
SUC	Company Selling Used Cars
SUSE	Software und System-Entwicklung
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UK	United Kingdom
UK SIC	United Kingdom Standard Industrial Classification
VPN	Virtual Private Network
WDC	Windows, Doors and Conservatories company
XML	Extensible Markup Language

1 Introduction

1.1 Background, Purpose and Objectives

The e-business environment is gaining greater importance because of the increasing numbers of Internet users who buy online and the increasing numbers of enterprises that buy and sell online. Between 2002 and 2007 on-line sales rose sevenfold from 1.1% to 7.7% of the total sales of non-financial sector businesses surveyed in the UK, being now worth more than £ 160 billion (National Statistics 2008a). Besides opening new markets for enterprises, e-business also has the potential to have a positive impact on existing business processes, such as improved speed, reduced cost (DTI 2002, Chapter 8), or it can renew business activities, for example by integrating the supply chain (DTI 2002, Chapter 1). An increasing number of governments and even trading blocs have realised the importance of e-business and they try to ensure that their enterprises are not left behind in international competition, for example the UK with its "office of the e-envoy", or on a bigger scale the EU, the OECD or the APEC (APEC & PWC 1999; European Commission 2008; OECD 2000; OECD 2002).

The problem when entering e-business or undertaking an e-business investment is however that enterprises and especially SMEs, tend to neglect strategies. In a fast paced area like e-business this could prove to be more dangerous than in the normal business environment. This is because SMEs might act too slowly and without careful planning and their decisions might be outdated too soon or because of their perceptions of the Internet, they do not use its full potential. These facts highlight a need to investigate whether and how SMEs plan an investment in e-business. This provides the basis to develop a model to help SMEs strategically plan this type of investment.

1

Selected findings discovered during this research have been presented to the academic community during conferences and have been published in academic journals (Meckel et al. 2004; Meckel, Walters, & Baugh 2005). This work contributes to knowledge in the area of strategic management and information systems.

The aim of this research was to develop a model that can be used by SMEs to strategically plan their investment in e-business. Several contributions helped in achieving this:

- Surveying the current situation concerning e-business and strategies in SMEs (quantitative)

- Classifying SMEs according to their attitudes towards e-business and strategies. This also helped by providing a reference point for future empirical work similar to the ladder of e-business adoption.

- Surveying the current situation concerning e-business and strategies in SMEs (qualitative)

- Relating the outcomes to the strategy planning process to provide a useful tool for SMEs that could be used to help planning their strategies in the area of e-business

1.2 Data collection and analysis method

The research begins with a literature review of the three main areas of importance: e-business, SMEs and strategic management. This literature review provided knowledge of the key issues for the research and also raised awareness of existing methodologies. A detailed investigation with focus on recent quantitative surveys in the area of SMEs

and e-business strategies was undertaken to gain more knowledge about the current situation regarding the use of strategies for e-business adoption in SMEs.

Quantitative as well as qualitative methods of data collection and analysis were used for this study. While the quantitative part of the study helps to create a new understanding in this study, specifically the SMEs' situation in relation to strategies and e-adoption, the qualitative part can help to deepen the understanding of this situation the SMEs are in. The first stage of the research made use of a structured questionnaire. The data was analysed using quantitative techniques and a taxonomy of e-business adoption and strategies in SMEs was created. The findings from this data analysis were then used as a basis for the second, qualitative stage. Data was collected from 29 SMEs selected according to their group affiliation ascertained in the taxonomy as part of the previous data analysis. The analysis of the data from the qualitative study was then used to find out more about current practice and the variation in the approach of SMEs (in these different groups) to e-business and strategies and helped to identify the patterns of action that have been undertaken by these SMEs that increase their chances of a successful e-business strategy.

1.3 Structure

The literature review in Chapter 2 identifies that most empirical research and theoretical models on strategy and e-business deals with large-scale or non-European organisations. There is some research dealing with the particular issue of strategy and SMEs (Frizelle 2001; Levy, Powell, & Galliers 1999) but these do not successfully show how the various strategic models can be used efficiently in SMEs.

Chapter 3 describes how the methodology used for this study was chosen, including quantitative, qualitative and mixed research methods.

In Chapter 4 the quantitative data collection stage is reviewed in detail. It addresses problems that arose when choosing the data source and sampling technique and describes the process of conducting a survey using questionnaires as well as preparing the acquired data for analysis.

Chapter 5 describes how the collected quantitative data was analysed. In the first part general statistical findings are described while the second part is concerned with the classification of cluster groups, to be used as a vantage point for further research.

Chapter 6 discusses the preparation and implementation of the interview stage and reports the findings from this stage.

Chapter 7 is concerned with strategic models. It looks at the strategic planning process and extends the strategy initiation, strategy formulation, strategy implementation and strategy assessment phase with an e-business component.

Chapter 8 presents a summary of the research conducted, draws conclusions from the research and discusses how this thesis advances current knowledge. This chapter concludes by making suggestions for future work based on the research undertaken.

2 Literature Review

2.1 Introduction

The literature review looks at established knowledge and ideas in academic literature for all areas covered by this research. Since the study is concerned with three different main strands, namely SMEs, e-business and strategies, the literature review will focus on knowledge and research in these different individual strands, as well as in areas that combine different strands. First SMEs and their importance are examined and different definitions as well as classifications for specific contexts are discussed. The term e-business is defined and the adoption of e-business by SMEs together with the resulting problems are examined. Since the use of strategies is an important part of this research, the notion strategy, its relation to Information Systems and its use in the business context are discussed and academic literature covering the use of business and e-business strategies by SMEs is reviewed. As there is a lack of research covering all the strands together, namely e-business, SMEs and strategies, they are also looked at individually or in pairs of twos, e.g. SMEs and e-business or e-business strategies. E-business surveys that are relevant for this research are discussed at the end of the literature review chapter.

2.2 SME

2.2.1 Importance

SMEs are a vital component for the economic success of Europe and the UK given their importance in terms of numbers, employment and revenue generation. According to Small Business Service (SBS 2002), 99.9% of all enterprises in the UK are SMEs. Using the EU definition they accounted for 45% of the turnover generated in the UK. Beaver and Prince write that "The number of small and medium-sized firms (SMEs) in the UK has increased by 50 per cent in the last 25 years and these are now responsible for more than half of all the jobs and contribute towards some 25 per cent of gross domestic product (GDP)." (Beaver & Prince 2004, p. 34). In Europe they represent 99% of all enterprises and provide around 65 million jobs (European Parliament 2004). Walczuch, van Braven, & Lundgren (2000, p. 561) write that "they often occupy strategic positions in the economy, positions for which large companies lack the flexibility". Blili & Raymond describe SMEs as "usually characterized by a high level of environmental uncertainty" (1993, p. 443) which means that problems relating to the IT use for strategic or competitive purposes (Raymond cited in Blili & Raymond 1993, p. 444) or problems with the business environment have a big impact on them, for example legal aspects when dealing with business partners.

2.2.2 Defining SMEs

There are many different definitions for small businesses or Small and Medium Enterprises (SMEs) in use. Current research, especially quantitative surveys (Arbore &

6

Ordanini 2008, p. 496; Auger & Gallaugher 1997, p. 63; Fletcher Advisory 2001; Riemenschneider, Harrison, & Mykytyn 2003, p. 274; Sadowski, Maitland, & van Dongen 2002), but also qualitative research (Bruque & Moyanob 2007, p. 243; Caldeira & Ward 2002) often develop their own SME definitions. This appears to be for reasons of convenience, as these definitions are often very simple compared to detailed definitions like the definition from the European Commission (1996). Using simple definitions can be useful for a researcher because complex definitions often contain a level of detail that is not necessary for a particular piece of research as it covers areas the researcher is not interested in and because an enterprise might be reluctant to reveal their internal structures which would be necessary for a detailed definition. There is however the danger that a simple SME definition does not cover a variable that would reveal whether a company is actually bigger than anticipated from the other variables. For example, when a company has very few employees but a very high turnover. Surveys sometimes use different size classifications for sub groups or they reduce their SME definition to the number of employees only without considering additional criteria (Arbore & Ordanini 2008; Lindgren 2001; Preece 2000). These problems make it hard to compare results from the different studies or to try to find common characteristics. Widely accepted definitions in the UK are for example the definition of the Committee of Inquiry on Small Firms (1971, p. 3) or the definition of the Companies Act from 1985. Although they are all different, with some including for example the number of vehicles owned by the company or setting different rules depending on the industry sector, most of them are relatively similar, as their key measures are the size of the enterprise, the number of employees and the turnover.

2.2.3 Classifying SMEs

SMEs can be classified in several ways. If they are classified by size the European Commission (1996) size classification criteria (medium, small and micro enterprises) can be used. When SMEs are classified according to the economic activities in which they are engaged in the UK, the Standard Industrial Classification of Economic Activities (UK SIC(92) is very useful. It provides classification codes for specific activities. Recent research however from Levy, Powell and Yetton (2001) quoted in Levy and Powell (2003, p. 176) suggest that the industry sector has little influence on ICT adoption. New research, that was not published until after the questionnaire was conducted suggests that it might be useful to classify SMEs according to several variables depending on their requirements and expected results as undertaken by Antonelli, Ravarini, & Tagliavini (2004). They created four SME profiles, namely "the Hand Crafted Enterprise", "the SubContractor Enterprise", "the Traditional Independent Enterprise", and "the Innovative Diversified Enterprise" as described in "Table 1 Antonelli, Ravarini and Tagliavini's Four SME profiles".

Hand Crafted Enterprise

Requirement variables		Expected result variables	
Company size	Micro/ Small	Range of activitiy	Local
Degree of diversification	Low	Third party dependence	Low
Characteristics of product	Tangible & Unique	Competitive strategy	Differentiation
Marketing abilities	Low	Relationships w. intermediaries	Traditional
Resistance to change	High (rarely low)		
Technical skills	Low		

SubContractor Enterprise

Requirement variables		Expected result variables	
Company size	Small	Range of activitiy	Regional
Degree of diversification	Low	Third party dependence	High
Characteristics of product	Tangible & Standard	Competitive strategy	Cost Leadership
Marketing abilities	Low	Relationships w. intermediaries	Traditional
Resistance to change	High		
Technical skills	Low (rarely high)		

Traditional Independent Enterprise

Requirement variables		Expected result variables	
Company size	Medium	Range of activitiy	National
Degree of diversification	Low	Third party dependence	Low
Characteristics of product	Tangible & Standard	Competitive strategy	Differentiation
Marketing abilities	High	Relationships with intermediaries	Traditional
Resistance to change	High		
Technical skills	Low		

Innovative Diversified Enterprise

Requirement variables		Expected result variables	
Company size	Medium	Range of activitiy	International
Degree of diversification	High	Third party dependence	Low
Characteristics of product	Tangible or Intang. and Standard	Competitive strategy	Cost Differentiation
Marketing abilities	High	Relationships with intermediaries	Automated
Resistance to change	Low		
Technical skills	High		

Table 1 Antonelli, Ravarini and Tagliavini's Four SME profiles

This classification looks very useful as a basis when looking at the ICT use of SMEs, but as it was published after the first stage of this research was conducted it could not be taken into account in the quantitative stage. Instead SMEs were classified according to their size, determined by the number of employees, their turnover and their legal form, and by their industry sector, determined by their SIC(92) code as explained later in chapter 4.3.2. The benefit of using the classification from Antonelli, Ravarini, & Tagliavini would have been the grouping of enterprises that are similar, even though

they are in different industry sectors. The quantitative stage of this research created a taxonomy that took many variables into account and the findings show the SMEs' attitudes in a similar way and indicate attributes like the enterprises resistance to change or their technical skills.

2.3 E-Business

There are many different explanations and definitions for the term e-business (Huff, Schneberger, & Wade 2000; IBM 2001; IBM 2003a; IBM 2003b; Kalakota & Robinson 2000; Kalakota & Robinson 1999; Lindgren 2001; PWC 1999a). IBM states that e-business is "the transformation of key business processes through the use of Internet technologies" (IBM 2003b) and that "e-business is the evolution of traditional business into electronic business. It uses Web technologies to streamline your processes, improve productivity and increase efficiencies." (IBM 2003a). Kalakota & Robinson write that "e-business is not just about e-commerce transactions or about buying and selling over the Web; it is the overall strategy of redefining old business models, with the aid of technology, to maximize customer value and profits." (Kalakota & Robinson 2000, p. 5). PWC define e-business as "the exploitation of electronic communications to improve business performance through enhanced customer service, new channels to markets, more efficient supply chain models and reduced costs. E-commerce is a subset of that; essentially trading on the Internet." (PWC 1999a, p.3; PWC 2000, p.5). All definitions and explanations of e-business differ slightly and look at different aspects of e-business, for example the technological side in IBM's e-business explanation "It uses Web technologies" (IBM 2003a) or the affected processes, described as "more efficient supply chains models" (Kalakota & Robinson 2000, p. 5). E-business definitions also often look at how the effects of e-business on the company "improve business

10

performance" (PWC 1999a, p.3; PWC 2000, p.5), or help to create "more efficient supply chains models and reduced costs" (PWC 1999a, p.3; PWC 2000, p.5), but together all these definitions and explanations have a common direction and give a basic idea of the notion "e-business". This electronic approach to business however, is not simply a small addition to the traditional business as it has the potential to renew the whole business process of an enterprise (Hawkins 1998; PWC 2002). All key business processes can be affected by e-business, while subsets of e-business like for example e-commerce and e-marketing, are confined to certain key business processes.

The notion e-commerce, which actually describes a subset of e-business, is often used interchangeably with the notion of e-business as defined by IBM (2001). This is the ability to buy and sell products and services over the Internet, including online display of goods and services, ordering, billing, customer service and all handling of payments and transactions. The most important categories of e-commerce are Business-to-Business and Business-to-Consumer (Strauss & Schoder 2000).

In his definition of e-commerce Whiteley (2000) refers to specific technologies and describes the mainstream of e-commerce as consisting of the areas, where the transactions take place (see Figure 1 Whiteley's three categories of e-commerce).

Figure 1 Whiteley's three categories of e-commerce

11
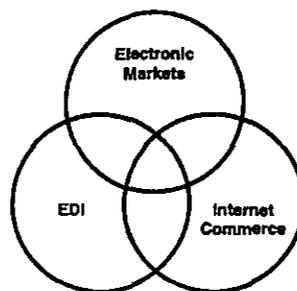
In this example "Electronic Markets" are the use of information and communications technology to present a range of offerings available in a market segment so that the purchaser can compare the prices and other attributes of the offerings and make a purchase decision. "Electronic Data Interchange" is a standardised system for coding trade transactions so that they can be communicated electronically between computer systems. As described by Mucha & Nottmeyer (2001) EDI is mainly used by large enterprises because of the high technical requirements and the necessity of adaptation of business processes to the demands of EDI. As alternatives for SMEs they propose Web-EDI, also known as EFI or EDI Lite (see OECD 2000), and XML. "Internet Commerce" is the use of the Internet to make once-off sales of a wide range of goods and services.

The OECD provides two definitions for e-commerce transactions. The broad definition states that "an electronic transaction is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organisations, conducted over computer mediated networks. The goods and services are ordered over those networks, but the payment and the ultimate delivery of the good or service may be conducted on or off-line." (OECD 2002, p. 89) while the narrow definition puts the broader definition in the specific context of the Internet. This definition is of special importance as the European Commission is using the OECD definition for e-commerce in official documents and is also using the OECD definition of e-business as "automated business processes (both intra- and inter-firm) over computer mediated networks" (European Commission 2008, p. 303).

12

2.4 SMEs' e-business adoption and associated problems

The benefits SMEs can obtain from e-business cannot easily be compared with benefits gained from information technology in the past, because it depends on the number of "other firms and consumers who adopt these technologies" (Windrum & de Berranger 2003, p. 196). In this respect e-business is more similar to telecommunication technology than to information technology. This suggests that Metcalfe's law applies which states that the value increases with the number of participants (Hendler & Golbeck 2008, p. 14), and with 65% of UK households having Internet access in 2008 (National Statistics 2008b) and on-line sales rising sevenfold within five years to 7.7% of the total sales of non-financial sector businesses surveyed in the UK in 2007 (National Statistics 2008a) the value of e-business is of great importance.

As described by Hawkins (1998) technological reasons are often secondary to commercial considerations for most enterprises that want to start with e-business. With e-business becoming more and more popular and common, it also increasingly becomes a competitive necessity. Hawkins (1998) indicates "that as more large firms embrace Electronic Commerce, more small firms are being compelled to follow suit in order to be able to do business with larger firms." Kalakota and Robinson also state that e-business can be a necessity "if any entity in the value chain begins doing business electronically, companies up and down that value chain must follow suit, or risk being substituted" (Kalakota & Robinson 2000, p. 6). Mehrtens, Cragg and Mills (2001, p. 169) discovered a similar phenomenon in their qualitative study. They highlight the external pressure to adopt the Internet, similar to the pressure in the past to adopt EDI. However this time the pressure is from customers, potential customers and competitors. This can be seen as a problem for SMEs, which are mostly not in a position to dictate

terms, and are dependent on larger companies where they are suppliers of products (goods or services) or the buyers of products.

Several problems arise for SMEs in this context. As described by Thong (2001, p. 1) "small businesses suffer from resource poverty. Without knowing the relative importance of key factors, small businesses may be expanding their limited resources and energy on less important factors which have limited contribution to IS implementation success." This resource poverty in the context of small enterprises as described by Welsh & White (1981, p. 18) also leads to disproportionate implementation costs if they have to adapt to the IT solution of the large company. The solution would most likely have to be implemented from scratch and would be tailored to the need of the large company rather than the SME. Another possible problem for SMEs is a technological 'lock-in' with specific trading partners when the IT solution of the large company involves proprietary rather than open standard. In this case SMEs cannot control the terms of entry into the electronic marketplace and have difficulties controlling the terms of exit. They may have used too many of their resources to follow their business partners and cannot afford to leave this market or will at least increase their dependence on those partners (Benjamin, Delong and Scott-Morton cited in Blili & Raymond 1993, p. 444). European SMEs also seem to neglect strategies and concentrate on tactical decisions instead.

When looking at SMEs in the context of e-business, they are usually classified according to their level of e-business adaptation. Most research has used similar ladders to classify the enterprises (e.g. Amor 2000; APEC & PWC 1999; DTI 2001; Lindgren 2001; Stroud 1998), although the number of possible levels and the e-business integration per level varies it also provides an illustration of the business benefits with

14

progressing organisational change during the transition from a "traditional" enterprise to an "e-business" enterprise. APEC and PWC (1999) use a similar system with 4 levels (early stage, achieved moderate levels, relatively advanced, advanced infrastructures and early adopters). Amor (2000) divides the e-business activity of enterprises into six phases (see Table 2).

Phase 1	Hello, I'm online, too
Phase 2	Structured Web site
Phase 3	Trying E-Commerce
Phase 4	Doing E-Business
Phase 5	Pervasive E-Business
Phase 6	One World – One Computer

Table 2 Amor's phases of e-business activities

Stroud (1998) uses his commitment-implementation matrix where he classifies organisations in a matrix according to six levels of commitment and five levels of implementation. The European Commission (OECD 2000, p. 14) classified business strategies concerning web-sites as described in Table 3.

1	promote, advertise, create brand awareness
2	increase turnover, market share, achieve sales
3	improve interaction with external partners (customers/suppliers)
4	improve interaction with the company (processes/organisation)

Table 3 The EC's classification of business strategies concerning web-sites

The most often used stage model is the e-adoption ladder from the DTI (DTI 2002) shown in Table 4. New research (Levy & Powell 2003) suggests however that a "contingent" model might be more useful than a "stage" model, because SMEs "will

focus on what is best to meet the owners' strategy for business growth" (Levy & Powell 2003, p. 181) instead of following a stage model.

First stage	e-mail
Second stage	Website
Third stage	e-commerce
Fourth stage	e-business
Fifth stage	Transformed organisation

Table 4 The DTI's e-adoption ladder

The prevalent use of this model led to further criticism when the use of the e-adoption ladder became more and more common. Alonso Mendo & Fitzgerald highlighted several weaknesses of the model (Alonso Mendo & Fitzgerald 2005, p. 126):

- an over-simplified perspective of complex issues and circumstances

- based on a false assumption that firms progress from basic to more advanced use of ICTs in a linear fashion

- a lack of empirical validation

- a generalisation that does not take into account the diversity of SMEs

- a lack of consideration of other change theories (e.g. evolutionary models)

- a focus on the broad picture of change in the industry, rather than individual instances

Findings from the quantitative and qualitative stages of this research will also support this criticism to some extent, with the most obvious problem being that many SMEs did not advance along the e-adoption ladder in a linear fashion. A common example for this is that several SMEs did have a web site, but did not use e-mail. When the first stage of this research was prepared the e-adoption ladder was still very new and stage models were not yet criticised by the academic community to the same extent as now. The e-adoption ladder was therefore a very promising model to be used in this research that

had the potential to help compare findings from this study with findings from other academic and commercial studies. As models are simplified representations of concepts the use of the e-adoption ladder is still justified, even in light of the criticism it has received. Alternatives that help to classify companies' e-adoption are often too complicated to be used in a study with SMEs without providing a detailed explanation that would be counterproductive when it comes to securing the cooperation of SMEs in a study and also because the prevalent use of the e-adoption ladder would also inhibit the comparison of findings if alternative models were used instead.

Brown and Lockett (2007, p. 94) define access routes to e-business applications for SMEs by their complexity (see Table 5), but also take external networks into account. They distinguish between three different levels of complexity: low, high and very high, with low complexity being roughly equivalent to the first two stages of the e-adoption ladder, high complexity being similar to the higher levels of e-adoption where ICT is used for internal processes, and very high complexity with additional links to external business partners and the use of industry specific applications.

Complexity	Application examples
Low	Internet access, e-mail, web site, web catalogue
High	As above plus buying and selling online and deep deployment of ICT in their internal processes – enterprise systems, financials, HRM and ERP
Very High	As above plus external collaborative linkages – eSCM, eCRM and industry specific applications

Table 5 Brown & Lockett's SME access routes to e-business applications

Grant (1999, p. 67-69) classified SMEs according to their maturity in e-commerce. This model helps to look at the internal characteristics such as the readiness for e-commerce and is used in current research (e.g. Ihlström & Nilsson 2003).

First stage of maturity	Immaturity
First intervention	Basic awareness raising
Second stage of maturity	On the Internet
Second intervention	Specific awareness raising
Third stage of maturity	E-commerce provisional strategy decided
Third intervention	Overcoming the obstacles
Fourth stage of maturity	Ready to implement
Fourth intervention	Implementation
Fifth stage of maturity	Integrated and effective e-commerce

Table 6 Grant's stages of maturity in e-commerce

Looking at the e-business adoption situation for SMEs in other European countries, specifically EU12 countries, and how they are approached might provide some useful insights.

The situation in Greece is quite different to the situation in the UK, as Greece has "some of the lowest levels of ICT and Internet adoption in the EU for both consumers and enterprises" (Buhalis & Deimezi 2003, p.322), with Greek SMEs using ICT "to a lesser extent compared to large firms" (Spanos, Prastacos, & Papadakis 2001), and the "adoption of new technology in SMEs is generally lower than other European countries, mainly due to lack of awareness and IT skills" (Buhalis & Deimezi 2003, p.322). Of particular interest for this research are the national ICT programmes that try to address these issues, as they might provide useful best practice that could be used in the UK. Greece's initiatives include the provision of an e-business forum between government,

academia and industry, providing trainers that are sent to SMEs by regional facilitators and the creation of e-marketplaces.

Findings from Italian studies suggest that most companies are not "able to embrace the full range of opportunities provided by e-business" (Piscitello & Sgobbi 2004, p. 345) and suggest that European actions that try to support the use of technology in SMEs should be based on the use of technology within the SME and that "institutional obstacles to the adoption of e-commerce practices (different standards and regulations, security of transactions and consumer protection), which are particularly harming for cross-borders' transactions (and, therefore, for the exporting firm), should be removed" (Lucchetti & Sterlacchini 2004, p. 165).

Small Dutch firms do not seem to exploit websites to their full potential and according to findings from a study conducted in the Netherlands, policy makers should guide them and show them concrete examples of benefits that SMEs can expect from e-business adoption (Walczuch, van Braven, & Lundgren 2000, p. 571).

The situation in Denmark is different since SMEs there seem to use e-business, but focus mainly "on the technical, economic and new sales channel areas of e-business and not so much on marketing, education and human resources" (Lindgren 2001, p. 232) and seem to develop and implement e-business "without formulated strategies" (Lindgren 2001, p. 232).

Studies from outside Europe such as the study by Riemenschneider, Harrison, & Mykytyn show that "smaller firms may not adopt new technology as quickly as larger

firms" (Riemenschneider, Harrison, & Mykytyn 2003, p. 276), which might also apply to SMEs in Europe and in the United Kingdom.

2.5 Strategy

After looking at SMEs and e-business in the literature review so far, strategy will be examined generally before relating strategies to SMEs and e-business. There are many definitions for the notion of business strategy. Chandler defined the term strategy in the 1960's and his definition is still of use for strategic management today: "Strategy can be defined as the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals." (Chandler 1962, p. 13) Compared to strategic decisions that Chandler defined as "concerned with the long-term health of the enterprise" he wrote that "tactical decisions deal more with the day-to-day activities necessary for efficient and smooth operations" (Chandler 1962, p.12).

Whittington (1993) looked at different theories of strategy and described the classical approach to strategy, where

- "profitability is the supreme goal of business, and rational planning the means to achieve it" (Whittington 1993, p. 11),

- the evolutionary perspectives on strategy, that "are less confident about the top management's ability to plan and act rationally [...] [but] expect the markets to secure profit maximization"(Whittington 1993, p. 17),

- the processual approaches to strategy, that are not only sceptical about rational strategy-making, but also about the markets' ability to maximise profit (Whittington 1993, p. 22) and

20

- the systemic perspectives on strategy that emphasise the sociological context when looking at strategy (Whittington 1993, p. 28).

Mintzberg, Quinn, & Goshal (1995) noticed, that even within the same document the term "strategy" is often used in various ways, hence they presented five definitions of strategy.

As plans, strategies may be general or specific and are "some sort of consciously intended course of action, a guideline (or set of guidelines) to deal with a situation". The aim is to establish a direction for organisations to set them on predetermined courses of action.

As a plan, a strategy can be a ploy, too, when it is very specific, e.g. a specific manoeuvre. The aim is to gain advantage in competition where "threats and feints and various other manoeuvres are employed". Mintzberg, Quinn, & Goshal (1995) also call these strategies "intended strategies".

Strategy can also be seen as a pattern. In this case strategy is "consistency in behaviour, whether or not intended". Unlike the plan definition, this also encompasses the resulting behaviour. Mintzberg, Quinn, & Goshal (1995) also call these strategies "realized strategies" and lists many different kinds of strategies that lie between the intended and the realised strategies, like for example unrealised strategies. The aim is to focus on action and to take behaviour into account.

When strategy is a position, it is the mediating force between the "internal and external context" or the "organization and environment". The environment or external context

21

could be a single competitor as well as a large number of competitors, the whole market or an environment at large. Mintzberg, Quinn, & Goshal (1995) also describe the "strategies as a position" as "seeking to locate the organization in the external environment, and down to concrete positions". The aim is to look at organisations in their competitive environments to find out how they meet, avoid or subvert competition.

Strategy can also be seen as a perspective. This definition "suggests above all that strategy is a concept" and "looks inside the organization, indeed inside the heads of the collective strategist, and up to a broader view". However, the key issue here is that the perspective is "shared by the members of the organization, through their intentions and/or by their actions". The aim is to find out about intention and behaviour in a collective context. Mintzberg, Quinn, & Goshal (1995) further notice that strategy as both position and perspective can be compatible with strategy as plan and/or pattern.

Discussing the potential development of the strategy and organisation fields, Whipp writes that "the strategy field has clearly defined information technology as a critical feature to be managed" (Whipp 1996, p. 272). According to Whipp, strategies for international business are another area where strategy may develop (Whipp 1996, p. 272). While e-business relies on information technology it also facilitates to some extent doing business internationally, thus combining two of the areas for strategy development as mentioned by Whipp.

Mintzberg & Lampel (1999, p.22) characterise strategy by ten major schools, that can be divided into the prescriptive, that "tend to adopt a 'managed growth' approach to knowledge"(1999, p. 29) and the descriptive, that "prefer a more 'natural growth'"

22

(1999, p. 29) but that all of these schools are important for understanding strategy from all perspectives.

Bellamy (2003, p.32) writes that general strategic management literature is "generally oriented towards application to large organisations, mentioning SMEs relatively superficially", but that Mintzberg's ten schools "may act as a range for comparative markers for the consideration of the nature of strategy formulation within small firms."

Having a strategy can provide a crucial advantage for an enterprise, while following only short-term tactics could lead enterprises without a strategy into unforeseen situations. The e-Reality 2000 (Strauß & Schoder 2000) survey shows the importance of strategy as this survey found that strategy-employing enterprises are in general more successful than those that do not use strategies, but states that the enterprises that employ strategies often develop them without sufficient thought. This is not only true for business strategies in general, but also for strategies for e-commerce (Chang, Jackson, & Grover 2003, p. 671).

Levy, Powell & Galliers state that the development of IS strategy is often "performed in an ad hoc manner, though it may be undertaken with the support of frameworks" (Levy, Powell, & Galliers 1999). All these surveys comply with Walters, Greenwood, & Eyers (Walters, Greenwood, & Eyers 2000) who state that SMEs are reluctant to carry out strategic analysis. This makes it difficult to build historical records of past strategic decisions and options. These are necessary to analyse past aims and objectives and to learn from previous mistakes. Without written aims and objectives it is easy to "adjust" the aims to the results afterwards. Enterprises might do this to appear successful, but

this misleads management into not taking strategy seriously and to acting without aims and objectives.

2.6 SMEs and e-business strategy

Entering the world of E-Business can be considered to be similar to undertaking a new investment such as the location of a new building, or the launch of a new product, or entering a new market, as all these activities require careful planning. Undertaking these investments is a major decision by a company although experience suggests that many companies especially SMEs are reluctant to spend any time carrying out formal analysis beforehand. Levy and Powell state that "There is little evidence of business strategy driving Internet adoption among SMEs" (Levy & Powell 2003, p. 175). Either they do not have a written down strategy or they specify the strategy in very general terms (Schindehutte & Morris 2001, p.84). Undertaking such an approach to investment decisions has a high chance of failure. E-Business is an uncertain area and even though it can be compared to other investment activities as it also requires careful planning, this uncertainty makes it very different to many other investments undertaken by a company. Tagg writes that "there are two aspects of change to be considered in relation to Information Systems: change caused by the technology and change in the environment" (Tagg 1995, p.3).

At the functional level strategies such as marketing strategy or production strategy are not influenced by the changes in technology as much as the IS strategy that depends much more on technology. The situation for e-business is similar: technology and the environment influence the success of an e-business strategy. To be successful it also

needs to be thought about; it needs to be planned; and it needs to be analysed how it will impact on business operations and processes.

The importance of having a strategy is not only emphasised when it comes to business strategies in general, but also in the context of e-business strategies (Fisher, Craig, & Bentley 2007, p. 253; Lumpkin & Dess 2004; Pai & Yeh 2008, p. 682; Tsao, Lin, & Lin 2004, p. 5; Zhao, Zhu, & Wang 2008, p. 4).

An e-business strategy is necessary either to gain a competitive advantage or to reduce a disadvantage. Reports from the DTI (PWC 2002), show that a "digital divide" is emerging between companies using e-business technologies and companies that neglect these technologies. Latest studies in this area show that this divide is not caused by access to technologies, but by the lack of knowledge, skills and planning (Arendt 2008, p. 106).

In Lindgren's survey (Lindgren 2001) of e-business strategies (conducted in Northern Denmark) 75% of the SMEs had no e-business strategy at all and 20% had an e-business strategy, that was not written down. A survey of the manufacturing sector in Middlesex (Sainidis, Gill, & White 2001) found that 73% of SMEs did not necessarily keep records of what was defined as the current manufacturing strategy. The e-Reality 2000 survey (Strauss & Schoder 2000) in Germany, Austria and Switzerland found that only about 23% of the enterprises had an e-commerce strategy.

In this context SMEs thus face a problem when it comes to the introduction or the increased use of e-business. The approach that they adopt cannot be modelled on the approaches of large enterprises since the resources of SMEs in terms of budget and

human resources are normally much smaller than those of large enterprises, which raises the question of how SMEs can use strategic thinking or planning at relatively low cost. This is consistent with academic literature about small businesses which established that they generally differ from large businesses because of their size and characteristics, as "a small business is not a scale model of a large business" (Thong, Yap, & Raman 1996, p. 249). As a result there are gaps in small business research, especially in the area of IT adoption in small businesses (Premkumar 2003, p. 116), as most studies of IT and IS adoption are aimed at large businesses, ignoring SMEs (Yang & Fu 2008, p. 323).

Most models or frameworks that could be used by European SMEs for developing e-business strategies were originally created for other types of enterprises. The problem here is "the majority of IS research is of large organizations" (Levy, Powell, & Yetton 1998, p.378). Levy, Powell, and Galliers (1999) report that "SIS frameworks are predominantly based on models of strategic behaviour of US business culture" (p. 248) and large organisations but that there are a number of key differences between large organisations and SMEs (p. 260). Although Frizelle (2001, p.128, p.133) discusses similar situations for SMEs and large corporations in some areas (e.g. diversity of business) he also emphasises the differences in the situation of SMEs and large enterprises.

Pleitner states that "Many small-business entrepreneurs are successful even without explicitly practising the kind of management usually described as strategic." (Pleitner 1989, p.72). He added that "by the time a firm has grown too big for one person to manage, management by instinct alone will no longer be enough." (Pleitner 1989, p.72) thus showing that there is the need for strategies in SMEs of a certain size.

Although much research about strategies has been undertaken for large enterprises this research cannot be assumed to be valid for SMEs, since as described by Curran and Blackburn (2001, p.5) a small business is not merely a scaled-down version of a large business, a point made also earlier in this chapter.

The aim of this study is to address the gap in current research by seeking to identify how SMEs use strategy when entering the e-business area. A model can than be developed that enables SMEs to find a suitable e-business strategy for their situation. This would also help to bridge the widening digital divide as using a suitable e-business strategy would address the lack of planning, the key element of the digital divide mechanism as identified in recent studies (Arendt 2008, p. 106).

2.7 Examination of e-business surveys

Before the start of this research several surveys have been conducted by other researchers to collect information about SMEs in general (Lindgren 2001), e-business or ICT use in general (DTI 2001; PWC 1999a; PWC 2000), SMEs and their Internet use (Amorós Espinosa 2003) or their attitude towards e-business (Fletcher Advisory 2001; PWC 1999b) and SMEs and their attitude towards strategy (Frost 2003; Sainidis, Gill, & White 2001). Shortly after the start of this research results of surveys investigating SME e-commerce / e-business strategies (Daniel, Wilson, & Myers 2002; Drew 2003) have also been published. Most of these surveys about SMEs are geographically specific and usually take the form of self-administered questionnaires or telephone interviews. These mainly quantitative surveys have been examined to get an overview

of current practice when it comes to e-business surveys in relation to format, survey
methodology and focus.

Name	Geographical area & Year	Survey & Sample	Focus / Outcome
(PWC 1999a)	Midlands (UK) 1999	telephone questionnaire contacted 100 of 8000	e-business expectations companies expect a significant growth of e-business, but do not use e-business yet and worry about potential security risks
(APEC & PWC 1999)	21 APEC economies before 1999	web survey (1300 replies), focus group (42), interviews (75)	measures to be taken to promote development of e-commerce for SMEs, suggestions for SMEs, i.e. economies should address security, taxation and legal issues, APEC should address cross-border policies and standards, awareness of e-commerce benefits should be raised in SMEs
(Lindgren 2001)	Northern Denmark 1999 - 2000	written questionnaire (83 replies from 337 contacts, telephone interview (63 out of 101 took part), semi structures interview with 20 SMEs	SMEs want to develop and implement e-business, but do not use strategies, are dissatisfied with performance and results, neglect marketing, management and other areas and focus instead on technical, economic and new sales channel areas of e-business.
(Sainidis, Gill, & White 2001)	Middlesex (UK) 2000	postal questionnaire response rate 10.16%	many SMEs do not have a written down strategy, while bigger companies within the SME sector are more likely to have a well-documented strategic plan
(PWC 2000)	Scotland (UK) 2000	telephone interviews 100 organisations	examining challenges, barriers, drivers, impact and other aspects of e-business Managing the changing technology is challenge to implementation of e-business. Tax, legal and regulatory issues are barrier. Customer information exchange and reduced overheads are drivers for implementing e-business.
(Preece 2000)	North West of England (UK) 1997	questionnaire 2289 replies from 30000 contacts)	frequency lists of variables measured in the questionnaire
(Fletcher Advisory 2001)	UK 2001	telephone interviews 200 companies case studies	improved communication through the Internet can increase productivity, lower costs and provide access to new customers
(Databuild Ltd 2001)	England (UK) 2001	telephone questionnaire 2000 companies	ICT is used to keep up with competitors, helps to increase sales, efficiency and therefore profits
(DTI 2001)	10 countries	interviews 7613 companies	government targets difficult to meet as most SMEs on too low levels of the e-adoption ladder
(Beynon-Davies, Jones, & Williams 2002)	South Wales (UK) 1999, 2001	questionnaire 100 companies	e-business increasing for small and medium sized companies, also looking at drivers, difficulties, benefits experienced by SMEs
(Zhu, Kraemer, & Xu 2003)	8 countries	survey 3100 businesses 7500 consumers	found five adoption facilitators and one adoption inhibitor
(Lucchetti & Sterlacchini 2004)	Central and Northern Italy	survey 168 SMEs	found three different types of ICT use in SMEs: general-use ICT, production-integrating ICT and market-oriented ICT

Table 7 Comparison of other e-business surveys

28

PricewaterhouseCoopers' Midlands e-business survey 1999. (PWC 1999a)

An early e-business survey was conducted 1999 in the UK Midlands. The main focus was on the expectations of the companies concerning e-business. PWC (1999a, p.5) describes the survey as a "tele-marketing survey with telephone questionnaires".

A stratified random sampling methodology was used to select a sample consisting of 100 companies from a sampling frame of 8000. PWC's report does not explain from where the sampling frame was taken. The sample was selected using a stratified random sampling methodology and contains SMEs as well as non-SMEs, stratified by turnover and legal form into four subsections that contain 25 companies each.

The results of this survey showed that many companies expect a significant growth of e-business and new opportunities in several areas, but they do not use e-business yet and worry about potential security risks.

1999 APEC survey SME Electronic Commerce (APEC & PWC 1999)

The survey of SMEs and electronic commerce was conducted in the 21 member economies of the APEC using four primary data-gathering techniques: a multilingual web survey, focus groups, key informant interviews and desk research. The web survey received more than 1300 replies, more than 75 interviews were conducted and more than 42 focus groups were organised.

As 21 economies are members of APEC it is difficult to find a common definition of an SME. The definition used for this survey is minimalistic and takes only the number of

employees into account. Since there are no restrictions on the turnover of the enterprises and SMEs are defined as enterprises having up to 500 employees, this survey includes organisations that would be classified as large enterprises in the EU.

PricewaterhouseCoopers used a categorisation of the SMEs e-commerce capabilities (APEC & PWC 1999, p. 7) that is similar to the DTI's e-adoption ladder (DTI 2002). The survey identified measures to be taken by the respective economies as well as by APEC as a whole to promote the development of e-commerce for SMEs, suggestions for the SMEs themselves and areas for further research.

Actions by individual economies include addressing security, taxation and legal issues, while actions for APEC as a whole include cross-border policies and standards. Suggestions for the SMEs mainly aim at raising awareness of the benefits from e-commerce.

Lindgren's survey E-business in SMEs in Northern Denmark – a descriptive survey (Aalborg University) (Lindgren 2001)

Lindgren's descriptive survey consists of three surveys conducted from November 1999 until September 2000 in three different areas in Northern Denmark and tries to show the problems the SMEs in this region will have to deal with in the future and their preparation for these problems. The focus is on SMEs and e-business although a few non-SMEs were included in the first survey.

The first survey was a written questionnaire that was mailed to 337 companies of which 83 responded. The second survey was a telephone interview questionnaire with 101 companies of which 63 participated. The last survey was a semi structure direct

interview with 20 SMEs, in which all of them participated. Lindgren describes the sampling technique for his surveys as "semi randomly".

Although the survey wanted to target SMEs the report gives the impression that only the number of employees has been used to classify the companies, not the other criteria defined by the Commission of the European Communities (1996). Additionally the size-classes of the companies were not chosen according to the EU definition (Commission of the European Communities 1996, Annex Article 3). These two problems make it hard to compare the results of this survey with other surveys about SMEs and e-business.

Lindgrens study found that even though SMEs are interested in developing and implementing e-business, they are actually dissatisfied with "their performance and results of the Internet and E-commerce until now" (Lindgren 2001, p. 231) and implement e-business without formulated strategies. They also neglect marketing, management and other areas and focus instead on technical, economic and new sales channel areas of e-business.

Sainidis', Gill's and White's Emergent strategies in SMEs (Middlesex University) (Sainidis, Gill, & White 2001)

The authors describe their survey as a "fact finding" survey of the SME strategy. The survey was conducted in 2000 with the aim of producing "a picture of how small-medium manufacturing companies formulate and implement manufacturing strategy" (Sainidis, Gill, & White 2001, p.242). This survey did not take e-business into account and was geographically limited to the area of the former county of Middlesex.

The survey took the form of a postal questionnaire and the population was taken from the 1999 Kompass Directory of British Companies. The authors never mention the sample size, which could mean that the sample was not very big, they mention however that the response rate was 10.16 %. The sample was stratified by the number of employees of the companies and did not include micro-enterprises.

The most interesting finding of this study is that a large proportion of SMEs do not have a written down strategy, while "bigger companies within the SME sector are more likely to have a well-documented strategic plan". (Sainidis, Gill, & White 2001, p.4)

2000, January: E-Scotland 2000 survey (PWC 2000)

The E-Scotland 2000 survey was conducted by PricewaterhouseCoopers in January 2000. Telephone interviews were conducted with 100 organisations. From the report it is not apparent whether and how many SMEs were included. The survey is however still interesting as it examined challenges, barriers, drivers, impact and other aspects of e-business in a geographically confined area of Britain.

Managing the changing technology was seen as the biggest challenge to the implementation of e-business and tax, legal and regulatory issues as the biggest barrier. Customer information exchange and reduced overheads were seen as the most important drivers for implementing e-business.

2000: Northwest e-Commerce survey (Preece 2000)

The 2000 e-commerce survey of small companies in the North West is the follow-up to another large scale survey of SMEs in the North West, undertaken in 1997. Altogether

30000 SMEs were sent a questionnaire and 2289 replies were received. The researcher used the Dun & Bradstreet database as a data source for the sample and mixed different sampling methods to choose the companies to be contacted. Unfortunately this survey did not use the official EU definition and subclassifications for SMEs, like Lindgren's survey (2001), even though the survey was commissioned and paid for by government bodies. The survey itself did not look at the use of strategy in any detail and the results of the survey are mainly frequency lists of different variables measured in the questionnaire, which in spite of its themes e-commerce, SMEs and the North West makes the survey less interesting as a source of ideas for this research.

2001: A survey of the Impact of Broadband on SMEs in the UK (Fletcher Advisory 2001)

This survey of the impact of broadband on SMEs was commissioned by BT and conducted during April and May 2001 using telephone interviews with 200 companies. There is nothing known about the sampling method used. Additionally a number of case studies have been conducted, but there are no further details about these case studies in the report. Fletcher Advisory define SMEs as companies with fewer than 100 employees, which makes it difficult to compare this study as no other factors are taken into account for this definition, and this definition does not match the SME definition or the definition of sub-categories in the official EU definition (Commission of the European Communities 1996). E-business is not covered explicitly, but the Internet connection of companies is seen as a technical e-business aspect. The survey itself does not seem to have been conducted in a strictly scientific way. It identified business benefits from companies that use broadband and suggests that improved communication

33

through the Internet can increase productivity, lower costs and provide access to new customers.

2001, August: Regular survey of small business' opinions (Databuild Ltd 2001)

This survey was conducted 2001 in England by Databuild Ltd for Small Business Services, an agency of the Department of Trade and Industry. The survey itself was conducted in the form of a telephone questionnaire. The sample consisted of 2000 enterprises (Databuild Ltd 2001, p. 5), stratified by SIC code and proprietorship. The Dun and Bradstreet database of enterprises in England was used as a data source. The definition of the sample size used in Databuild's survey is however not mentioned. Inconsistencies with the number of companies contacted (Databuild Ltd 2001, p. 30) suggest that the answers of 2000 were used for the final statistics. Only 6 of the 147 questions asked have a relation to computers and e-business, but some outcomes and the strict compliance with a well-defined survey methodology makes the Small Business Services survey interesting for the survey conducted in the quantitative stage of the PhD research: the calculation of confidence intervals for the results, as well as the investigation of the effect of incentives on the response rate found that "incentives had no significant effect on the response rate" (Databuild Ltd 2001, p. 30).

2001: DTI INTERNATIONAL BENCHMARKING REPORT 2001 (DTI 2001)

The DTI international benchmarking report 2001 benchmarks businesses in the UK against those in France, Germany, Italy, Sweden, US, Canada, Japan, Republic of Ireland and Australia. The contact details for the sample were taken from different sources, mainly from Dun and Bradstreet's company database and companies were

chosen using random sampling. In the UK 3113 companies were interviewed while 500 companies in each other country were interviewed. The response rate in the UK was between 30% and 40% while the response rate in other countries was between 10% and 40%.

Cardiff Chamber of Commerce (Beynon-Davies, Jones, & Williams 2002)

This study described as longitudinal research conducted on the awareness and uptake of e-business amongst the SMEs in the South Wales region over a two-year period consisted of a pilot and a main questionnaire sent to members of the Cardiff Chamber of Commerce. The researcher received 100 replies in total for the main questionnaire, 77 replies by mail, and 23 more replies after contacting non-respondents on the phone. While the study found that SMEs in South Wales increased their use of e-business technologies in the last two years it also found that micro sized enterprises seems to have difficulties when it comes to the uptake of e-business.

Electronic business adoption by European firms (Zhu, Kraemer, & Xu 2003)

Zhu, Kraemer and Xu developed "a conceptual model for studying the adoption of electronic business [...] at the firm level" (Zhu, Kraemer, & Xu 2003, p.251). The survey data was collected from 3100 businesses and 7500 consumers from eight different countries, including the UK, and analysed using the technology-organization-environment (TOE) framework from Tornatzky & Fleischer (Zhu, Kraemer, & Xu 2003, p.252). The study found five adoption facilitators and one adoption inhibitor. Technology competence was identified as a facilitator in the technological context, while firm scope and firm size are the facilitators in the organisational context. In the

35

environmental context consumer readiness and competitive pressure are facilitators while the lack of trading partner readiness was seen as an inhibitor. The findings from this study provide interesting insights into the influence of the technological, organisational and environmental context on the enterprises, especially because the findings passed several reliability and validity tests and they would have been taken into account if they were available when the questionnaire described in chapter 4 was created.

2004: Adoption of ICT among Italian SMEs (Lucchetti & Sterlacchini 2004)

Lucchetti's and Sterlacchini's empirical study was based on a stratified sample of 168 SMEs in Central Italy, that are representative for Central and Northern Italy, but not for the less developed South of Italy. Non-respondents of the survey were replaced with similar enterprises, so 168 answers could be analysed. A taxonomy was created from the findings that identified three types of ICT use:

- General-use ICT, where the Internet and e-mail is used, is the cheapest form of ICT use and is independent of any specific feature of SMEs.

- Production-integrating ICT, where ICT is linked to the production process, is the most expensive form of ICT use and depends "on the firm's size, the extend of productive linkage to other firms [and] the use of advanced information technologies in production and the educational level of the labour force" (Lucchetti & Sterlacchini 2004, p.165).

- Market-oriented ICT, where a web site is present, linked to highly educated employees and the presence of the SME in foreign markets.

The study found that the SMEs adoption and effective use of ICT depend on the types of ICT, as described in their taxonomy, which require different amounts of financial resources and technical skills, as well as on different firm characteristics.

Conclusion

Examining other studies that focus on e-business was very useful as it provided an insight into a variety of quantitative survey methodologies used in this area, and an insight what response rates can be expected for different survey types. It also helped by highlighting many problems encountered in this area of research today, mainly the lack of use of standard definitions, which makes it difficult or impossible to compare many of the surveys because they use different definitions of SMEs or because the authors have very different ideas about what level of e-adoption constitutes e-commerce and e-business. The outcomes of the studies helped to have a better overview of current measures taken to encourage e-business and expectations, challenges and barriers of SMEs and their e-business adoption.

2.8 Summary

The literature review chapter has looked at the different areas of this study and helped to define them, specifically SMEs, e-business and strategy. After an investigation of the research undertaken in these three areas, important literature combining different areas together was presented. In this context the first focus was on the e-business adoption of SMEs and the associated problems, then on SMEs and their e-business strategies. A range of surveys undertaken in these areas have also been reviewed in this chapter.

Working on this chapter has led to the following findings, which are important for this study:

- The literature review has shown that there is no consistent use of definitions for SMEs, e-business, or strategies

- SMEs are neglected in strategic management literature where the focus is on large organisations

- The use of strategies is generally seen as advantageous
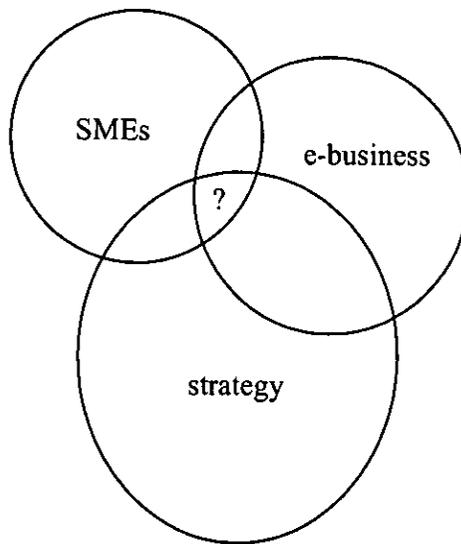
Figure 2 Areas of concern

Figure 2 shows the three areas of concern, namely SMEs, e-business and strategies. The literature review helped to gain a better understanding of the current situation of SMEs in relation to their e-business adoption and their e-business strategies. This first finding addresses the research question 1 posed in chapter 3.2. It also showed that there is an imbalance regarding the studies in these areas with strategic management literature focussing on large organisations and with a gap where these three strands meet. This gap is identified in Figure 2 by the question mark. To close this gap it is necessary to study the strategies and the e-adoption of SMEs in more detail and to establish how different strategies and e-adoption influence SMEs. This aim is phrased in the research

question 2 found in chapter 3.2. Once it is clear what different types of SMEs there are, based on their e-adoption and their strategies, it is then necessary to examine how these different attitudes manifest themselves and how different types of SMEs use and benefit from e-business technologies and strategies. Research question 3 in chapter 3.2 is addresses this issue. Finally the knowledge gained from the research can be used to support the SMEs by providing a strategy development process that includes e-business. Research question 4 in chapter 3.2 will be phrased to support this objective.

3 Methodology

3.1 Introduction

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This chapter outlines the research questions, the methodology, including the data collection and analysis method, used in the research undertaken for this PhD. A sequential explanatory approach is used and the present chapter aims to justify and present the chosen approach. This is achieved by introducing the different quantitative, qualitative and mixed-mode approaches to research methodology and by outlining qualitative and quantitative research and their analyses. Strategies of mixing these methods and analyses are also presented, followed by a summary of the data sources and research methods used for this research. The quantitative method used is discussed by presenting the choice of data collection technique, the sampling method used and the sample size determination, followed by a description of the pilot conducted and the paper-based and web-based questionnaires that were used in the mixed-mode quantitative data collection. The qualitative method used for the second stage of the research is introduced and the choice of data collection technique explained.

3.2 Research questions

The aim of this research is to create a taxonomy of SMEs based on their use of strategies and e-business and to support SMEs in their e-business strategy development. The methodologies described in this chapter help to address the following research questions that are listed below.

1. What is the current situation of SMEs in relation to their e-business adoption and their e-business strategies?

2. Are there different types of SMEs based on their e-adoption and strategies?

3. How do the different attitudes of SMEs towards e-adoption and strategies manifest themselves?

4. How can SMEs include e-business in their strategy development process in a "quick and easy" way?

3.3 Quantitative, qualitative and mixed research methods

3.3.1 Quantitative versus qualitative approaches

Quantitative research and qualitative research are the two main approaches to research methodology in the social sciences. Researchers in the area of quantitative research and qualitative research have different world views which are described by Easterby-Smith, Thorpe, & Lowe (2002, p. 55) as the ontologically very different research philosophies between realism and nominalism, namely positivism, where the main idea is to try to use objective methods for research (Easterby-Smith, Thorpe, & Lowe 2002, p. 28), and social constructionism, where research happens through communication and people's thinking and feeling and where the researcher becomes part of what is being studied (Easterby-Smith, Thorpe, & Lowe 2002, p. 30).

Ackroyd and Fleetwood observe that some management approaches assume that there is not much difference between management studies and natural science. One example is business economics (Ackroyd & Fleetwood 2000, p. 3), which is traditionally rooted in positivism, while there are other areas, such as management education, where positivism is not commonly used or even rejected.

As described by Neuman (1997, p. 63) "positivist researchers prefer precise quantitative data and often use experiments, surveys, and statistics". The positivist paradigm, and thus quantitative methods, can "provide wide coverage of the range of situations, they can be fast and economical and, particularly when statistics are aggregated from large samples, they may be of considerable relevance to policy decisions" (Easterby-Smith, Thorpe, & Lowe 2002, p. 42).

The disadvantage is however that they concentrate on what is or was recently, and do not examine the reasons behind the current state.

The social constructionist paradigm on the other hand looks at the meaning and ideas behind the world and tries to understand them. This is an advantage but at the same time a disadvantage, as it makes collecting and interpreting data more difficult, harder to control, and harder to prove which, as discussed by Easterby-Smith, Thorpe, & Lowe (2002, p. 42), "may give low credibility to studies based on apparently 'subjective' opinions".

Critical realism is a relatively new approach that tries to solve the problem of incompatible views of positivism and social constructionism and the quantitative-qualitative dilemma. Its proponents believe that objects and reality can exist

42

independently of our minds. This means that they exist whether they are observed or not, which in turn means that our knowledge of them is fallible (Benton & Craib 2001, p. 120; Blaikie 1993, p. 58; Fleetwood 2005, p. 198; Kwan & Tsang 2001, p. 1165; Sayer 2000, p. 11; Scott 2007, p. 14). Critical realism can be a useful underpinning philosophy for management science and information systems as shown by Dobson, "allowing a more consistent approach to research" (Dobson 2002). A critical realist perspective is therefore suitable in the context of this study as it would allow studying the first two research questions from a positivist point of view without inhibiting the study of the third and fourth research question from a social constructionist point of view.

Several different approaches and philosophical stances that would be appropriate to the nature of this research were considered. This meant that initially positivism and quantitative methods as well as social constructionism and qualitative methods were examined further in order to determine the most appropriate philosophical stance and the data collection method. The nature of the research, e-business strategies for SMEs, would permit the use of a range of theoretical frameworks and research processes. As data was to be obtained from primary sources it could be collected following a quantitative or a qualitative tradition.

Bryman & Bell (2007, p. 426) summarise the contrasting features between quantitative and qualitative research (see Table 8).

Quantitative	Qualitative
Numbers	Words
Point of view of researcher	Points of view of participants
Researcher distant	Researcher close
Theory testing	Theory emergent
Static	Process
Structured	Unstructured
Generalization	Contextual understanding
Hard, reliable data	Rich, deep data
Macro	Micro
Behaviour	Meaning
Artificial settings	Natural setting

Table 8 Bryman and Bell's contrasts between quantitative and qualitative research

As described by Neuman (1997, p. 419) quantitative and qualitative data analysis have similarities, since both forms examine information to reach a conclusion, by reasoning and simplifying the complexity of the data. The method or process used for analysis is recorded, evidence is compared and errors should be avoided. While quantitative research uses very standardised techniques, qualitative research is more inductive and the process less predictable (Strauss 1987, p. 108). In this context Miles (1979, p. 590) describes qualitative data collected during the study of organisations as an 'attractive nuisance' since the qualitative data is rich and seems to be valid, while "analyzing the data is a highly labour intensive operation" and "methods of analysis are not well formulated" (Miles 1979, p. 590) whereas the conventions for quantitative data are much clearer. Another difference is the fact that unlike quantitative data, qualitative data can be analysed before data collection is completed. Neuman (1997, p. 419) also mentions two more major differences, qualitative research creates new concepts by blending empirical evidence and abstract concepts, while quantitative research would

typically test hypotheses. Qualitative analysis is also less abstract than quantitative research, that is measuring the world through numbers, and it uses data in the form of "words, which are relatively imprecise, diffuse, and context-based, and can have more than one meaning". (Neuman 1997, p. 419). As both quantitative and qualitative analysis are valid types of data analysis for this research their use and their strategies of inquiry, as well as the advantages and disadvantages of mixing them will be discussed next, to be able to make an informed decision as to which method is more suitable to create meaningful and useful data for this research.

3.3.2 Mixing quantitative and qualitative methods

Having discussed the general difference and the contrasts between quantitative and qualitative research in the previous paragraphs, the methods and concrete strategies of inquiry as well as ways of mixing them will now be examined.

Qualitative and quantitative research methods are both common research methodologies that treat data in different ways. While variables and variable categories are isolated and defined by the quantitative researcher (Brannen 1992, p.4), "the qualitative research begins with defining very general concepts which, as the research progresses, change their definition" (Brannen 1992, p.4). The different research methods therefore offer different strategies of inquiry. Common strategies used for quantitative research are experiments and surveys, while qualitative research is exploratory and uses the strategies listed in Table 9, adapted from Creswell (2003, p.13-15). Even though these strategies were used exclusively in the past Bryman writes that "the integration of

quantitative and qualitative research has become increasingly common in recent years"
(Bryman 2006, p. 97).

Quantitative	Qualitative
Experimental designs	Narratives
Non-experimental designs	Phenomenologies
Surveys	Ethnographies
Questionnaires	Grounded theory
Structured interviews	Case studies

Table 9 Quantitative vs. qualitative strategies of inquiry

Different strategies and research methods are however linked to different paradigms, which also include different philosophical world views (Reichardt & Cook 1979, p. 11). This means that combining the two methods can raise issues and problems for the theoretical framework of the research. Brannen describes how quantitative researchers isolate variables to frame hypotheses and test them upon the data, unlike the qualitative researcher who starts with rough concepts and changes their definition during the research process (Brannen 1992, p.4). There is however the view that quantitative and qualitative methods should not compete with each other but should be complementary (Jick 1979, p. 602). This view can help to address the different research questions of this study using quantitative and qualitative methods, combined under the critical realist approach.

According to Creswell (2003, p.15) "the concept of mixing different methods probably originated in 1959". At that time Campbell and Fiske developed the idea that "more than one method should be used in the validation process to ensure that the variance reflected that of the trait and not of the method" (Jick 1979, p. 602). Multiple approaches to data collection were soon examined by other researchers. Reichardt &

Cook (1979) describe how the different methods "can build upon each other to offer insights that neither one alone could provide" (Reichardt & Cook 1979, p. 21) and that multiple techniques allow the researcher to triangulate the underlying truth. All methods have limitations so mixing these methods can overcome limitations of specific data analysis methods by neutralising the bias created by a single research method.

One of the more comprehensive lists of the different mixed method strategies has been compiled by Creswell (2003, p.213) who describes six different strategies, three sequential strategies and three concurrent strategies that can be adopted when conducting research using a mixed methods approach. Hammersley (2002, p. 167) created a similar classification, mentioning triangulation, facilitation and complementarity. One of the most exhaustive summaries of different approaches to integrating quantitative and qualitative research is presented by Bryman (1992, p.59). Amongst others he summarises

- triangulation, where findings from one type of study are checked against the findings derived from the other type of study
- quantitative research that facilitates qualitative research
- qualitative research that facilitates quantitative research,

and discusses advantages and problems of integrating different types of methods and different types of data.

Following is a non-exhaustive list of approaches that were considered for this research in order to facilitate addressing the research questions, followed by a conclusion of the approach chosen as being the most suitable research strategy for this study.

47

Triangulation

Triangulation, the cross-checking findings from one type of study, e.g. a quantitative study, against findings from other types of studies, e.g. a qualitative study, can be a useful method to corroborate findings from a study (Brannen 2004, p. 314; Kelle & Erzberger 2004, p. 174). Traditionally mixing quantitative and qualitative methods was unacceptable in social sciences (Burton 2000, p. 298), but the concept of triangulation itself developed in several stages since 1959 as described by Tashakkori & Teddlie (1998, p. 41) and during this development it was accepted by more and more researchers. Creswell even describes it as "the most familiar of the six major mixed methods models" (2003, p.217). Triangulation is used by several authors to describe all kinds of mixed methods, combining qualitative and quantitative methods, but since the different kinds of mixed methods are mentioned here separately this argument concentrates on the concurrent triangulation strategy as described by Creswell (2003, p. 217). One of the main disadvantages of this strategy is the potential difficulty when comparing data from the very different data collections and the problem faced with when trying to resolve discrepancies that might occur when comparing this data (Creswell 2003, p. 217). Even though triangulation would be a useful mixed methods design for this study it could lead to problems if the findings from the quantitative part and the qualitative part contradict each other. To resolve this problem additional data would have to be collected. The problem of additional data collection can be addressed and is discussed in great detail by Creswell & Plano Clark (2007, p. 110), but as part of a PhD thesis with limited resources and limited time this uncertainty makes triangulation a mixed methods design suitable but suboptimal.

Other concurrent strategies

Other concurrent strategies like the concurrent nested strategy (Creswell 2003, p. 218), also called multilevel research (Tashakkori & Teddlie 1998, p.48) and the concurrent transformative strategy (Creswell 2003, p. 219) can be a useful tool to study a phenomenon, like triangulation. Since the literature review revealed a lack of research in the area of e-business strategies for SMEs, it was felt that a sequential strategy with an initial collection and analysis of data, that can later be refined, would be more appropriate for this study as it enables the research to gain more knowledge about the enterprises at an intermediate level, before the decision makers are studied in-depth at an individual level (explained in more detail later for Table 10 Data sources and research methods).

If quantitative and qualitative methods are used together concurrently, both types have to be used with the same ontological assumptions, because data that was collected using methods that deal with different realities cannot be combined (Blaikie 2000, p. 274). This does however not pose a problem for this study as critical realism, described earlier on page 42, can help to address this difficulty.

Sequential explanatory strategy

The sequential explanatory strategy (see Figure 3) as described by Creswell (2003, p. 215; Creswell & Plano Clark 2007, p. 73) is known by different names. Bryman describes the same strategy as quantitative research that facilitates qualitative research (Bryman 1992, p.59) and in this context Scott writes about sequencing as a further

attempt at combining two approaches within the ontological position of "alignment" (Scott 2007, p. 8). Creswell described it as "the most straightforward of the six major mixed methods approaches. It is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data" (Creswell 2003, p. 215).

Sequential Explanatory Design

Quantitative Data Collection → Quantitative Data Analysis → Qualitative Data Collection → Qualitative Data Analysis → Interpretation of Entire Analysis

(Creswell 2003, p.213 there erroneously labeled "Exploratory")
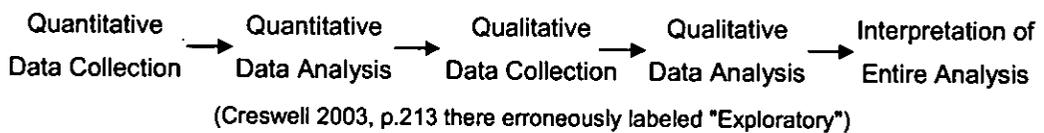
Figure 3 Creswell's Sequential Explanatory Design

Other sequential strategies

Other sequential strategies include the sequential exploratory strategy and the sequential transformative strategy (Creswell 2003, p. 215; Creswell & Plano Clark 2007, p. 75). The sequential exploratory strategy, also mentioned by Bryman & Bell as qualitative research that facilitates quantitative research (Bryman & Bell 2007, p. 648), has some similarities to the sequential explanatory strategy with the main difference being an initial stage consisting of qualitative data collection and analysis, followed by quantitative data collection and analysis. The first qualitative stage can help to provide hypotheses (Bryman & Bell 2007, p. 648) or emergent theories (Creswell 2003, p. 215). The sequential transformative strategy on the other hand needs a theoretical perspective that guides the study which is more important than the use of methods. Used by researchers using a transformative framework, this approach is however not well explored (Creswell 2003, p. 216).

When combining different methods that occur in different stages of the research it is not necessary to adopt consistent ontological and epistemological assumptions because the research strategies can be different in those different stages. Data can then however only be interpreted and not directly translated between the stages and assumptions of the different realities have to be kept separately (Blaikie 2000, p. 275). Scott (2007) tries to provide a critical realist solution to the problem of combining quantitative and qualitative approaches, even though pure sequential strategies "cannot resolve the quantitative-qualitative divide because they operate at the level of method and as a consequence, epistemological and ontological concerns are neglected" (Scott 2007, p. 10). It is however possible to reconcile the different approaches when they are focussed on different properties of social objects (Scott 2007, p. 15). Following Fleetwood's discussion of ontology in organisation and management studies (2005, p. 201), an example for social objects in this context could be aspects of the e-business strategies of the SMEs.

Application to this research

Mixing quantitative and qualitative methods can be useful for researchers as shown before. When looking at research focussing on business strategy, different methods can be used, which are mutually supportive of each other (Huff & Reger 1987, p. 227; Thomas 1984, p. 61).

This study uses the sequential explanatory approach as described by Creswell (2003, p. 215) and Bryman (1992, p.59) as a guideline. This means that the findings from the first

data analysis can be used to inform the second stage of the research. Recent literature (Igo, Kiewra, & Bruning 2008; Ivankova, Creswell, & Stick 2006) discusses the use of the sequential explanatory approach in real research, while Hanson et al. (2005, p. 230) list research in the area of counselling that made use of this approach in the past. Ivankova, Creswell, & Stick even describe the mixed-methods sequential explanatory design as "highly popular among researchers" (Ivankova, Creswell, & Stick 2006, p. 4). As the second stage will use qualitative data collection methods, practical reasons limit the geographical reach of the second stage as companies will have to be visited in order to conduct interviews.

In the quantitative first stage of this research a questionnaire was used as the main data collection method (see chapter 4). Building on the literature review the questionnaire helped to identify the respondents' attitudes towards e-adoption and strategies. The knowledge gained from the questionnaires was then used to create a taxonomy as the outcome of the data analysis stage. This taxonomy was subsequently used as the basis for the second, qualitative stage where detailed views were collected from SMEs from the different groups as identified in the taxonomy created earlier. The next section will explain in detail the method used to undertake the first stage of the research and the rationale for the sampling technique chosen.

The research design used for this study followed a sequential explanatory approach, which has been described by Creswell as "better suited to explaining and interpreting relationships" (Creswell 2003, p. 215) than other sequential approaches like the exploratory strategy. Tashakkori & Teddlie describe how this approach can be used to form categories in the quantitative stage and subsequently "validate the categories or [...] expand upon the information that is available regarding these subconstructs"

(Tashakkori & Teddlie 1998, p. 135) during the qualitative stage. As part of the implementation in this research, clusters of companies can be determined in the quantitative stage depending on the use of e-business and strategies. For the qualitative stage these clusters can then be studied further to explore their strategic planning.

Since a critical realist philosophy has been adopted for this research data from the different stages can be more easily combined because they have the same assumptions with the same assumed realities, avoiding the problems described earlier for sequential strategies that are used with an inconsistent set of ontological and epistemological assumptions. The study tries to reconcile the different stages ontologically as described by Scott (2007, p. 15) by explaining the social setting extensionally, using statistical data analysis, for the macro and intermediate level in the first quantitative stage and intentionally, using qualitative data analysis, at the individual level in the second, qualitative stage (Sayer 1992, p. 243). A summary of the data sources and research methods used on different analytical levels in this research can be found in Table 10.

Level of Analysis	Data Sources	Research methods
Macro level: Wider context	Published research	Literature review
Intermediate level: Enterprises	Published research Self administered questionnaires through mail and web	Literature review Extensive (Analysis of questionnaire)
Individual level: Decision makers (managers, owners)	Face to face semi-structured interviews	Intensive (Analysis of interviews)

Table 10 Data sources and research methods

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53

3.4 Data collection techniques

3.4.1 Quantitative data collection techniques

There are several strategies of inquiry associated with the quantitative approach. Creswell (2003, p. 14) mentions experiments and surveys. Experiments usually try to test the effects of a treatment or intervention (Creswell 2003, p. 154), which makes it unsuitable for our more exploratory study of SMEs. Surveys on the other hand usually take the form of self-administered questionnaires or structured interviews, by telephone or face-to face (Creswell 2003, p. 14; Neuman 1997, p. 251), which makes them more suitable for this study. Wilson mentions several techniques of data collection, with three of them being suitable for the quantitative stage of this study, namely face-to-face interviews employing an interview schedule, telephone interviews and postal questionnaires (Wilson 1996, p. 94).

Interviews

Being used as a data collection technique in the quantitative stage of the research interviews would have to follow a strict schedule for the questions being asked, be it for face-to-face interviews or for telephone interviews (Wilson 1996, p. 94). Compared to the main alternative, questionnaires, face-to-face interviews can be expensive and time-consuming (Healey & Rawlinson 1994, p. 125; Johnson & Turner 2003, p. 308) and even though telephone interviews would be cheaper, they would still be very time

54

consuming when being conducted with a large number of interviewees, as the interviewer would have to contact every interviewee by phone and would have to ask all questions and record all answers on the phone. Even though interviews can have advantages over questionnaires, for example the provision of in-depth information (Johnson & Turner 2003, p. 308), these advantages usually apply to qualitative interviews, not to interviews used as a quantitative data collection technique.

Questionnaires

As the advantages interviews can have over questionnaires cannot be applied in this quantitative stage of the research, questionnaires were chosen as the main data collection method for this stage. Sekaran (2003, p. 251) lists advantages of postal questionnaires which include the possibility of reaching participants from a wide geographic region easily and the possibility of administering the questionnaires electronically as well. Possible disadvantages are low response rates, the fact that questions cannot be clarified and the necessity of follow-up procedures for non-responses. As questionnaires were chosen as the data collection method measures taken to address these disadvantages will be described in this chapter.

Sampling

There are two general types of sampling methods or sampling techniques (Clark et al. 1998, p.75; Fink & Kosecoff 1998, p.41): probability and non-probability sampling.

Probability sampling is where each element in a population, in this case each enterprise, is randomly selected when forming the sample and where each of these elements has a known, non-zero chance of being selected. (Clark et al. 1998, p.77; Fink & Kosecoff 1998, p.41). In this section the most common probability sampling methods and their advantages and disadvantages for this research will be described, as the choice of sampling method can potentially influence the outcome of the study as choosing the wrong sampling methods can result in a biased sample of SMEs.

Simple random sampling is, as the name suggests, the most simple form of probability sampling. Each element, i.e. each enterprise in the population has an equal, non-zero chance of actually being selected (Clark et al. 1998, p.77; Fink & Kosecoff 1998, p.41). The random element will normally ensure that the sample drawn from the population is representative as long as the sample is big enough.

Quasi-random sampling is not wholly random. In quasi-random sampling only the first element is chosen at random. All following selections are related systematically to the first (Clark et al. 1998, p.78). According to Clark, Riley, Wood, & Wilkie (1998, p.79) there is a "fairly low" probability that the sample chosen with quasi-random sampling is biased. Systematic sampling is very similar. Hussey & Hussey explain that in systematic sampling "the population is divided by the required sample size (n) and the sample (is) chosen by taking every nth subject" (Hussey & Hussey 1997, p.146).

Stratified sampling or stratified random sampling tries to ensure that the sample drawn from a population is as representative as possible in terms of characteristics of that population (Clark et al. 1998, p.79) or that different groups in the sample are represented in the desired proportions (Fink & Kosecoff 1998, p.42). Especially if the

56

sample is relatively small stratified sampling can help to avoid under or overrepresentation of groups, e.g. micro-enterprises (Hussey & Hussey 1997, p.147).

Multi-stage sampling involves two or more stages and is often associated with studies where the population is geographically widespread (Clark et al. 1998, p.83). One use for multi-stage sampling is for example to save on travelling costs for interviews with companies.

Cluster sampling or simple random cluster sampling is similar to multi-stage sampling. Instead of elements from the population, groups or clusters of the population are chosen and then all elements of this group or cluster are part of the sample (Clark et al. 1998, p.85; Fink & Kosecoff 1998, p.43; Hussey & Hussey 1997, p.146).

Non-probability sampling

Unlike probability sampling, where every element has a known chance of being selected, in non-probability or purposive sampling the chance of selection for each element in a population is unknown and for some elements is zero (Clark et al. 1998, p.76); the elements are not chosen randomly but purposively (Clark et al. 1998, p.85). Probability sampling is generally preferred "when the representativeness of the sample is of importance in the interest of wider generalizability" (Sekaran 2003, p. 270), while non-probability sampling is used when time or other factors are more important than generalisability, which is not the case in this research.

Choice of sampling method

Compared to probability sampling methods the samples in non-probability sampling methods are usually easier to assemble but are less representative of the population (Fink & Kosecoff 1998, p.43). In this way quota sampling can, for example, be used to deal with the limitations associated with street research (Clark et al. 1998, p.87). For this survey similar limitations that require easy assembly of the sample do not apply and there is therefore no need for a non-probability sampling method because all elements for the sample can be chosen from a database.

Since the sample will not be small and the population was carefully chosen there should also be no need for stratified sampling in this research because no different subgroup of the total sample should be misrepresented.

The survey for this research takes the form of a self-administered questionnaire that will be geographically limited to the North West of England or an area within the North West of England. Hence there is also no need to use multi-stage sampling. Creating stages could be used to reduce travel cost, e.g. for interviews, but multi-stage sampling is not only more difficult to conduct but also less random than simple random sampling and there is therefore the danger of reduced representativeness.

Cluster sampling is not really useful for this research, since SMEs have more characteristics in common with individual elements rather than with members of a group, because they are not in predefined groups. It could be argued that SMEs are members of a group defined by a geographical area or an industry sector, but if only certain industry sectors are chosen the result of the research might be adulterated and

defining geographical areas does not provide advantages over simple random sampling because the questionnaires were distributed by post.

For this survey there was also no need to use quasi-random or systematic sampling because there is a population available from which all elements can be easily chosen by using simple random sampling, hence simple random sampling is the most appropriate sampling methods for the questionnaire stage of this research.

non-probability sampling	+easier to assemble - less representative of population
stratified sampling	- different subgroup might be misrepresented.
multi-stage sampling	+ reduce cost associated with conducting interviews - more difficult to conduct and higher danger of bias
cluster sampling	- not useful as SMEs are not easily 'groupable'
quasi-random sampling systematic sampling	- not necessary as elements can be easily chosen
simple random sampling	+ representative + no specific disadvantages for this research

Table 11 Summary of sampling methods

Sample size

An important question in relation to sampling is finding the appropriate sample size. The sample size should be large enough to be representative for the population it was chosen from (Bryman & Bell 2007, p. 195; Clark et al. 1998; Easterby-Smith, Thorpe, & Lowe 2002, p. 135; Fink & Kosecoff 1985, p. 61; Fink & Kosecoff 1998; Neuman 1997, p. 202) and the bigger the sample size, when chosen randomly, the more representative it is, even though this is not a linear function.

Unfortunately, as discussed in chapter 4.2, there is no data source known to be representative of the population that could be used as the sampling frame for this study. SMEs do not have to register as such at one central point, meaning that they have to be found and added to the databases first. The problem with this situation is, that new SMEs might not have been discovered and therefore not been added yet. Other SMEs could have closed down already or became too big to be an SME, but they might still be listed in the database. Additionally, some SMEs might have certain characteristics that make them difficult to 'detect', e.g. they might be too small to be easily found or they might have changed their address or name after being added to the database. This problem is outside the scope of this research, but as described in chapter 4.2 the researcher tried to chose a data source that seemed as representative of the population as possible.

$$Ns = \frac{(Np)(p)(1-p)}{(Np-1)(B/C)^2 + (p)(1-p)}$$

Equation 1 Dillman's sample size calculation

Using Equation 1 from Dillman (2000, p. 206) while choosing the worst case percentage for p, using the dti's small business service (2002, p. 1) figures of 3.7 million enterprises for the UK in 2001, using a 95% confidence interval and an acceptable amount of sampling error of ±5%, the completed sample size needed for the questionnaire is 384. If the acceptable amount of sampling error is however changed to ±10%, a less common but still typical value for research, or a more favourable value is assumed for p, then the completed sample size needed for the desired level of precision drops to 96 or 248 respectively (see Table 12).

60

Confidence interval	95%	95%	95%
Sampling error	±10%	±5%	±5%
Incidence of cases	50/50	50/50	80/20
Completed sample size needed	96	384	248

Table 12 Completed sample size needed for desired level of precision

Estimating the expected response rate is a difficult, non-precise task, but necessary to determine the number of questionnaires necessary to send out. A similar survey conducted 1999 / 2000 in Denmark yielded a response rate of 25% (Lindgren 2001, p. 2), while a study conducted before 2001 in the USA saw 17% of questionnaires returned (Riemenschneider, Harrison, & Mykytyn 2003, p. 276) and a similar survey conducted in the United Kingdom in 2000 only received 10.16 % replies (Sainidis, Gill, & White 2001). Instead of deciding on the desired level of precision now all three variations listed in Table 12 are taken into account, and assuming a response rate similar to Lindgren's, between 384 and 1536 SMEs would have to be contacted. The researcher settled for a value of 1000 SMEs to be contacted, as there are too many unknown variables to calculate the number of SMEs to be contacted and contacting 1000 SMEs provides a balance between extreme values for sampling error and the incidence of cases ratio. This also complies with the minimum necessary sample sizes set out by Mundfrom, Shaw and Ke (2005, p. 164) for conducting factor analysis, which, although technically is different to cluster analysis, is very similar to cluster analysis as used for the data analysis (see 5.3).

After conducting the pilot of the questionnaire it was established that an electronic version of the questionnaire should be made available for the SMEs (described in chapter 4.3.2). As research is not always a linear process this discovery at the

implementation stage led to changes that introduced another cycle of planning and implementation. The following paragraphs will discuss the planning stage of the questionnaire, namely the background of the paper- and web-based questionnaires.

Paper based

The final version of the questionnaire itself consisted of four A4 pages copied onto a folded A3 sheet.

Fink and Kosecoff describe that "a self-administered questionnaire that is hard to read can confuse or irritate respondents. The result is a loss of data."(Fink & Kosecoff 1985, p. 44). To avoid this problem several questionnaires from different authorities like the Inland Revenue (Form SA100) and the NHS (Form HC1) were studied before designing the layout of the questionnaire and in the end the layout chosen for the questionnaire was modelled on questionnaires used by the NHS. This was done to provide a tested and possibly familiar look for the paper based version of the questionnaire.

Newby, Watson, & Woodliff describe how they used personalised addressing to avoid 'gatekeepers' and to get the questionnaires through the reader's 'attention filter' (Newby, Watson, & Woodliff 2003, p. 166). The questionnaires used in this study were also personalised, i.e. the questionnaires were addressed to the manager or business owner, when possible. The information necessary to personalise the questionnaires was taken from the database.

As described by Dillman (2000, p.165) and Clark et al. (1998, p.98) questionnaires should be identifiable, so that follow-up mailings can be sent to non-respondents. The questionnaires for this survey were identifiable by an identification number, the company number plus a check digit as described on page 96. This identification number was printed on the first page of each questionnaire and was used to identify the respondents who filled in the paper version of the questionnaire. The web version of the questionnaire had the check digit embedded in the code of the web pages. This enabled the identification of respondents, so that non-respondents can receive follow-up mailings. It also enabled us to verify that every respondent only submitted one questionnaire, when the modus operandi made it possible for them to submit more than one version, e.g. by submitting one paper and one web version of the questionnaire or by submitting the first paper questionnaire after the reminder was sent out and then submitting the reminder questionnaire as well.

Web based

Theoretical background

Providing an electronic version of the questionnaire additionally to the paper version of the questionnaire added another mode of response and makes the survey a mixed-mode survey (not to be confused with mixed-method surveys). No academic literature was found that compared parallel and sequential mixed-mode surveys directly. Having studied a parallel mixed-mode approach using mail and telephone, Dillman et al. (2001, p. 3) state that "giving respondents a choice of which mode to respond to does not necessarily improve response rate". In a mixed-mode survey using mail, telephone and

personal interviews with college graduates, conducted by Shettle and Mooney in 1999 (see Dillman et al. 2001, p. 3-4) it was found "that a sequential strategy of making multiple contacts to ask people to respond to a particular mode, and then switching to multiple contacts by another mode, will improve response rates" (Dillman et al. 2001, p. 3). As described by Dillman (2000, p. 220) measurement differences are a potential error consequence when collecting panel data from the same respondent at a later time. It was therefore decided to use a parallel mixed-mode survey, where the respondents were given a choice of how to respond in order to avoid possible measurement differences. Since as many recipients as possible should be able to use the electronic version of the questionnaire there are two main choices available: e-mail and the web.

Dillman describes coverage, sampling, nonresponse, and measurement as "the four cornerstones of survey precision and accuracy" (2000, p. 197). The mixed mode approach uses the same sample as a single mode survey, so it can be assumed that there are no implications for coverage error and sampling error. Since using a mixed mode approach is not likely to decrease the number of replies to the survey there should not be any negative effects on non-response error, leaving measurement error as the greatest area for potential problems in a mixed mode survey. The problem of potential measurement error caused by an additional mode was tackled by keeping both modes as similar as possible as described on page 97. This left only the original measurement error reduced by providing the explanation sheet attached in Appendix IV.

Pitfalls and Opportunities

One of the problems with mixed mode surveys as described by Dillman et al. (2001, p. 2) is the concern "whether people who respond by one mode provide the same answers as would have been the case had they responded by another mode". In another paper Dillman (2000, p.219) described different mixed-mode situations for surveys and found that only two of these situations have no potential consequences for error: The collection of different data from the same respondents during a single data collection period and the use of one mode only to prompt completion by another mode.

Several advantages make a mixed-mode survey with an additional World Wide Web version of the questionnaire interesting for researchers.

Unlike paper questionnaires, where the answers have to be scanned or typed in to provide them in a machine-readable format, the answers from web questionnaires are already machine-readable. They are typically stored in a database and only have to be converted into a format readable by a statistics package. This not only saves time and work for the researcher but also eliminates the chance of incorrectly transcribing the respondent's answers.

Cobanoglu, Warde, and Moreo (2001) compared mail, fax and web based survey methods and received the highest response rate, the second highest response speed, the lowest cost and the highest response quality for web surveys in their experiment. Although a parallel mixed mode survey alone seems to offer no increased response rate

65

(as described with a paper / telephone example by Dillman et al. 2001, p. 3), including a web-based questionnaire might offer the benefits described by Cobanoglu, Warde, and Moreo (2001).

Alternatives for electronic distribution

e-mail

When looking at the distribution of questionnaires via e-mail, Dommeyer & Moriarty (2000) describe three ways of distribution:

a) embedding the questions in the e-mail,

b) attaching the questionnaire to the e-mail,

c) attaching a survey program to the e-mail.

Embedding the questions in the e-mail can take the form of plain text or HTML code. The respondents have to be instructed how to mark their answers in the questionnaire. Answering such a questionnaire is not very convenient for the respondent because it cannot be done with a simple mouse click. If the respondent makes a mistake, e.g. using a wrong character to mark a multiple choice question or not placing this character at the exact position required, the answers in the questionnaire might no longer be machine-readable and manual entry of the respondent's answers may be hampered. When looking at plain text questionnaires Dillman (1998) describes the problems arising from different e-mail formatting, e.g. line widths. If the embedded questionnaire is sent as HTML code it cannot necessarily be assumed that the recipient is able to view the

questionnaire, since not all e-mail programs support HTML. Even if the recipient can see the e-mail there is no way of telling how it will be displayed because there is no standard minimum pixel resolution used by e-mail programs to display HTML code. Ranchhod & Zhou (2001) discuss four other factors raising problems when using e-mail for surveys:

- Lack of anonymity,
- Lack of authoritative image,
- Lack of incentive
- Lack of design features.

Lack of anonymity and authoritative image present a possible reason for recipients refusing to respond. It is much more difficult to address these problems by e-mail than it is on the World Wide Web. In this study the lack of tangible incentives was not disadvantageous because the only incentive offered was the sending out of the study findings if requested. The lack of design features as discussed by Ranchhod & Zhou (2001) does not take HTML e-mails into account, but as discussed earlier the use of HTML e-mails will create other problems. The great benefit of e-mails is speed of response (Bachmann, Elfrink, & Vazzana 1996; Tse 1998), which was, however, not an important issue for this study.

Attaching the questionnaire to the e-mail does not really improve on the situation compared to an embedded questionnaire: when it is attached as a plain text or as HTML, the respondent will have to deal with the same difficulties that appear if the

questionnaire is embedded. Other formats, like PDF, offer benefits but also create serious problems as discussed later on page 95.

Attaching a survey program also creates new problems, because the program must be compiled for the type of computer on which it is intended to run. Alternatively an interpreter will have to be installed on the respondents' computers to run the survey program.

World Wide Web

Web surveys "not only have a more refined appearance to which color may be added, but also provide survey capabilities far beyond those available for any other type of self-administered questionnaire" (Dillman 2000, p. 354). Dillman, Tortora, & Bowker state that "collecting responses via the web eliminates printing and mailing costs, and makes near automatic compilation of results possible" (Dillman, Tortora, & Bowker 1998, p.1). Another big advantage is that, if the questionnaire is carefully designed with HTML, it can be displayed as intended by the designer on nearly every machine that can access the World Wide Web as discussed in chapter 4.4.1. Another advantage is the close similarity to the paper version of the questionnaire, as discussed in the 'similarity' section of chapter 4.4.3, which cannot be achieved with plain text e-mails. A World Wide Web survey can also be designed to be very convenient for the respondent, e.g. by clicking on the answers seen on screen, as well as for the researcher, as the answers can be saved and easily converted into the format necessary for statistical software packages as discussed in chapter 4.3.1.

<u>Fax</u>

Cobanoglu, Warde, & Moreo (2001) compared mail, fax and web-based survey methods; they state that fax surveys had a high speed of response and low cost, but also the lowest response rate. In this study fax is seen as just another way of returning the paper version of the questionnaire, not as a real electronic version, so no additional attention was paid to fax as another mode for the survey. Although a fax number was provided in the letterhead, the cover letter did not specifically mention the possibility of sending replies to that number.

3.4.2 Qualitative data collection techniques

There are different qualitative data collection types, each with their own options within the specific type, with their own advantages, but also with their own limitations. Creswell (2003, p. 185) describes four basic types of collection procedures in qualitative research. They are similar to the techniques for making qualitative data, as described by Morse and Richards (2002, p. 91), with the main difference being that Morse and Richards do not summarise techniques into data collection types.

The four data collection types are

- Observations
- Interviews
- Documents
- Audiovisual material

Observations

Creswell (2003, p. 186) lists several options available for researchers who want to conduct observations, classified according to the degree of participation. The researcher can completely participate in the environment to be studied, concealing his or her role, the observer can participate with his or her role being known to others involved, the role as observer can be secondary to the participant role, and finally the researcher can observe without any participation.

Advantages

Foster (1996, p. 58), as well as Robson (2002, p. 310) describe the advantages of observation compared to interviews and questionnaires. Instead of relying on information reproduced by the participant, the researcher can record information directly. This avoids potential inaccuracies of the information that can occur because of several reasons. The participant might remember information incorrectly or might want to create a favourable representation for the researcher. This possible source of error is avoided with information being recorded directly by the researcher. Another possible advantage is that the researcher might perceive details through careful observation that the participant might not mention, or that could be difficult to describe.

Limitations

The main limitations of observations are also described by Foster (1996, p. 59), Robson (2002, p. 310), and Creswell (2003, p. 186). There are several reasons why observations might not be possible. The area to be studied might not be accessible for observations. In the context of SMEs the managers might not agree to a time-intensive observation by a researcher, because the benefits of the study for the SME might not be incentive enough and the enterprise fears revealing trade secrets. Another disadvantage as described by Foster is the fact that "people may, consciously or unconsciously, change the way they behave because they are being observed" (Foster 1996, p. 59), or as Jones and Somekh describe it "observers always have some kind of impact on those they are observing who, at worst, may become tense and have a strong sense of performing, even of being inspected" (Jones & Somekh 2005, p. 140). While observation compared to interviews helps by avoiding contamination by the interviewee, it also creates a situation where the observer has to record the observed and thus records his or her constructed representation of the observed, potentially adding bias. One of the biggest disadvantages is however that compared to other methods of data collection observations are much more time consuming (Foster 1996, p. 60). In the context of the e-business strategy of SMEs there is also the additional problem that the e-business strategy does not happen in a specific place at a specific time, meaning that even while observing an employee or a meeting there is the danger of missing information somewhere else within the SME that has an influence on the e-business strategy. Additionally, as described by Bryman and Bell (2007, p. 297) the intentions behind the observed are very difficult to get at.

Interviews

As described by Healey & Rawlinson "Interviews with owners and managers are a prime source of information on the activities of businesses" (Healey & Rawlinson 1993, p. 339) and managers, i.e. the management in SMEs are linked to the motivations and actions of the key actors, since they help understanding the relationships between "ownership and decision making, managerial styles, organisational structures and cultures, and patterns in business development" (Beaver & Prince 2004, p. 35). After the quantitative stage, the qualitative stage sets out to find out more about the activities in businesses and the motivation behind business decision, particularly in the area of e-business and strategy. In this context Johnson and Turner describe how "the interviewer can probe the interviewee for clarity or for more detailed information when needed. This is an advantage of interviews as compared to questionnaires where interviewer probing is not possible" (Johnson & Turner 2003, p. 305). When the decision has been made to conduct interviews there are many traditions to choose from when it comes to how to conduct the interviews.

Interview styles by control

Powney and Watts categorise interviews based on "the locus of control for what happens throughout the interviewing process" (1987, p. 17). Even though they recognise other typologies of interview styles, they try to create a clear and simple distinction and acknowledge that their choice of only two categories "might not be doing full justice to the complexity of interviewing as a process" (Powney & Watts

1987, p. 17). Their two main styles are labelled respondent interviews and informant interviews.

The main aim of respondent interviews in this context is to satisfy the needs of the interviewer for information on specific topics. The degree of structure within the interview can vary, but all the questions of the interviewer have to be answered because the main reason of the interview is to deal with issues set by the interviewer.

Informant interviews on the other hand are not structured by the interviewer. Instead the interviewee can impose a structure onto the interview which helps to understand the interviewees position. This might make the interview look less structured from the interviewers point of view, but since the interviewer can not know what information is available from the interviewee he or she would not be able to take this information into account in a respondent interview and might miss it.

As the companies interviewed in this study all have very different backgrounds in terms of size, industry sector, use of strategy, knowledge of e-business technologies and level of e-adoption it was felt that the use of respondent interviews might not be beneficial for the study as they will include the danger of missing useful information not known to the interviewer that might possibly contribute to the study. On the other hand informant interviews might not be focussed enough and lead to far away from the areas of interest, namely the companies strategies in relation to their e-adoption.

Interview styles by standardisation

Typologies can also be based on the level of standardisation. Healey and Rawlinson (1994, p. 127) differentiate between standardised interviews and non-standardised interviews. While their standardised interviews are following a more quantitative research design and are commonly asking identical questions in the same order, the non-standardised interviews are flexible when it comes to the wording of the questions and they usually follow a qualitative research design. Even though this classification of interview styles can be useful for the qualitative stage of this research, it is in some areas similar to the classification of interview styles by structure, which is more often used in later literature. Therefore this part of the methodology chapter concerned with interviews will explore the classification of interview styles by structure in more detail.

Interview styles by structure

The commonly used typology is however based on the degree of structure of the interview (Bernard 2000, p. 191; Robson 2002, p. 270; Saunders, Lewis, & Thornhill 2000, p. 243). Interviews are categorised as structured interviews, also called fully structured interviews, as semi-structured interviews, and as unstructured interviews, also called in-depth interviews (see Table 13).

	Exploratory	Descriptive	Explanatory
Structured		✓✓	✓
Semi-structured	✓		✓✓
In depth	✓✓		

Table 13 Saunders, Lewis and Thornhill's uses of different types of interview

Interviews with the highest degree of structure, the structured or fully structured interviews have "predetermined questions with fixed wording, usually in a pre-set order" (Robson 2002, p. 270). To avoid bias the interviewer should present the questions as similar as possible during the different interviews. As discussed by Bernard (2000, p. 193) structured interviews are not very different when compared to self-administered questionnaires. The main difference is that they are administered by an interviewer which means that additional explanations could be given if necessary or additional instructions can be followed by the interviewer.

Choice of interview implementation

As discussed previously, one way of classifying different interview situations is based on the amount of control exercised over people's responses. This has also been shown by Bernard (2000, p. 190). In this context less controlled interviews are often more qualitative. An example of an interview that follows a more qualitative tradition would be the field interview, described by Neuman (1997, p. 371) as "unstructured, nondirective, in-depth interviews". On the other side there are interviews that follow a more quantitative tradition, for example survey research interviews, which are standardised, appear neutral and without taking care of the social context (Neuman 1997, p. 371). Between these two extremes, there are many other types of interviews adopted by researchers, one example being semi-structured interviews as described by the United Nations (1990), Morse & Richards (2002, p. 91), Bryman & Bell (2003, p. 343) and Bernard (2000, p.191).

For the qualitative stage of this research interviews that are too structured are not suitable, since every SME interviewed is in a different position and if questions can not be adapted to their position there is the danger that important information might not be captured.

The findings from the quantitative stage of this research gave some insight into these companies, but not enough to have a clear understanding of the e-business situation of each SME, as the aim was to classify the companies depending on their use of e-business and strategies. This means that it is not possible to structure the interviews in advance according to all the aspects that should be studied. Instead there must be enough freedom for the researcher to follow up strands of conversations that can lead to a better understanding of the SME's environment, situation or motivation, should they arise. "The main advantages of an interview are that the interviewer [...] can also clarify any ambiguous questions, probe answers that are too brief, and query discrepancies in the replies" (Healey & Rawlinson 1993, p. 341). This would be very useful as it would allow the researcher to follow up answers by the interviewee in more depth, should this be necessary. At the same time some degree of structure must be provided. Semi-structured interviews are suitable for the situation encountered by the researcher at the beginning of the second, qualitative stage, as they provide enough flexibility to react to any unanticipated development of the interviews (Morse & Richards 2002, p. 94), while providing structure to ensure cross-case comparability (Bryman & Bell 2003, p. 346). More details regarding the implementation of the interviews are presented in chapter 6.2.

3.5 Summary

This chapter set out the methodology used for this research and presented the research questions. A number of methodologies useful for investigating the e-business strategies of SMEs were presented, and the approach chosen for this study, namely a sequential explanatory approach, justified. The research methods and the corresponding data sources were also presented for the different levels of analysis. The quantitative data collection techniques for the first stage were explained and justified. This includes the innovative method of a mixed-mode questionnaire that is conducted on paper and online. The special characteristics of online questionnaires and the issues when combining with a more traditional data collection technique like paper questionnaires were illustrated. The choices of sampling methods for the quantitative stage were also presented and a suitable method chosen. Qualitative data collection techniques were then introduced and the choices of interviews for the second stage of this study explained.

4 Quantitative Data Collection

4.1 Introduction

The methodology chapter of this study provided the theoretical concept for quantitative, qualitative and mixed research methods. This chapter implements the theoretical concept from the previous chapter by looking at available data sources for the first stage of this study and by presenting the questionnaire development. The issues surrounding the introduction of a web questionnaire as part of the innovative and new way of conducting a mixed-mode survey are also addressed.

4.2 Data source

As described by Curran and Blackburn (2001, p.61) there are special difficulties when researching SMEs. One of these difficulties concerns the data source: they indicate that there are rarely up-to-date lists of relevant small businesses available from which a convincing representative sample could be recruited and that there is no single publicly accessible register of businesses in the UK (SBS & Dale 2001). Although there is an official Inter Departmental Business Register from 1998, the DTI (Curran & Blackburn 2001, p.61) Hoinville and Jowell state that it fails to pick up many micro or small businesses and that it is not up-to-date (Hoinville & Jowell 1977). It was decided that the survey should be regionally based in the North West of England to make it possible to conduct more in-depth qualitative research with selected key enterprises in the second stage.

78

This section will therefore consider the available data sources that can be taken as a base for the population and will discuss their advantages and disadvantages.

4.2.1 Electronically accessible

UK Business Browser

The University of Central Lancashire subscribes to the "UK Business Browser" from OneSource. The main advantages are that this database is electronically accessible through the World Wide Web. OneSource also offers means to filter the database for certain criteria, which makes it easy to choose a population for the survey that consists of e.g. all SMEs in the NorthWest of England or in Lancashire. There seems to be an ongoing data collection where old companies are removed and new one added to keep the database up to date. A major disadvantage is that this database contains information about fewer enterprises than many other databases. In March 2002 there were 8,374 enterprises listed for the NorthWest of England and 4,298 enterprises for Lancashire , both including non-SMEs.

The fact that there are fewer enterprises in the UK business Browser's database suggests that there will be a bigger bias in the research. It is likely that the enterprises in the database have a common attribute that makes them more likely to be "caught", e.g. advertising in the yellow pages. Additionally the entries for most of the enterprises in this database contain details about their financial status, which could be due to a common attribute of the enterprises, e.g. the enterprises published information about

79

their sales because the enterprise is doing very well. Although it is not proven that the research will be more biased if this database is used, there is still the chance of an increased level of bias that might be hard to eliminate even if the samples are stratified and that can be easily avoided by choosing another data source.

Business Link

Business Link North and Western Lancashire offered the use of their database that contains, according to their own statement, information on about 25,000 enterprises in West Lancashire.

The major advantages are that the database is electronically accessible and that it contains information about a large number of enterprises. According to Business Link there are also enterprises of almost every industry sector in West Lancashire. This would make it possible to confine the survey to the West Lancashire area.

According to Business Link West Lancashire the database is out of date. This is of course a very serious disadvantage. The enterprises might have moved or closed down, which means that the number of valid enterprises in this database would actually be lower than the stated amount of 25,000 and if questionnaires are sent to closed down enterprises the envelopes will not be returned as undelivered and these companies will be counted as non-respondents although they should in fact not have been included in the sampling frame and can therefore be deleted (see Hoinville 1977, p. 71). Another problem is the additional bias because enterprises that are "new" would be missing completely in the survey and therefore limit the findings to "established" enterprises

80

which might have in general a different attitude towards strategy and e-business. Business Link was also not able to provide more information about the attributes of the enterprises that were included in their database which makes it impossible to determine in advance which ones are SMEs.

If the database would have been up-to-date it would have been a good source of company information, but the problems caused by an outdated database as mentioned earlier are too serious to make this database a viable alternative.

UCLAN Business Services

The Business Services office from the University of Central Lancashire offered the use of their database. It concentrates on companies from all sectors in West Lancashire, but also includes companies from east Lancashire, Cumbria and other areas in the North West of England. About 4,000 of the entries were validated by phone the previous year and the entries of the database also contained the number of employees, the sector and a person to contact. As this database was created to be used internally it is not available in a standard database format but the data is instead kept in a spreadsheet that is used to access entries of the database.

The fact that parts of the database had recently been validated and that there is an ongoing validation made this database very suitable to be used for this research as there would be very few companies that had moved or closed down in the final sample.

DTI	UKBB	BL	UCLANBS
- Coverage of small companies insufficient	- Fewer entries	- Out of date	+ Recently validated

Table 14 Summary of electronically accessible databases

4.2.2 Not electronically accessible

There are also many listings of enterprises available that are not electronically accessible. They are normally available in the form of books but they share the big disadvantage that it would take an unreasonable amount of work and time to use them for a survey with a sample size as large as in this survey. If the information provided about enterprises was however superior to the electronically accessible data sources it might still be feasible to use them.

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Dun & Bradstreet Europa 2002

This data source contains 9,685 British enterprises and is up to date. Unfortunately the enterprises are generally too large in terms of employees to use this data source for research on SMEs.

Dun & Bradstreet Key British Enterprises 2001

This data source contains the 50,000 leading British enterprises. Since only "leading" enterprises are included there would be a bias in the survey. Additionally the data source is not up to date (2001).

Dun & Bradstreet Business Register Lancashire Summer 2001

Although no exact figure about the number of enterprises listed in this register is given it seems to be very substantial. Unfortunately only enterprises with more than 5 employees or an annual turnover of more than £ 250,000 are included. Additionally the data source is not up to date (Summer 2001).

Central Lancashire Business Directory 1999/2000

Again no exact figure about the number of enterprises listed in this register is given and the data source is not up to date (1999/ 2000).

Kompass Directory of British Companies 2001/2002

With 47,000 enterprises listed this directory seems to be very suitable, especially because the enterprises are not limited to "leading" enterprises as in Dun & Bradstreet's Key British Enterprises 2001. The data is however not really up to date. The survey should also be regionally based in the North West of England and compared to Business Link's database with 25,000 enterprises only in West Lancashire, this data source with 47,000 enterprises for the whole United Kingdom is not as suitable if the survey should be conducted in the North West or in an area within the North West of England.

Europa 2002	KBE 2001	BRLS 2001	CLBD 99/00	KDBC 01/02
Companies too big	Biased out of date	Out of date no Micro enterprises	Out of date	Out of date

Table 15 Summary of databases not electronically accessible

4.2.3 Choice of data source

A database from the UCLAN Business Services was chosen in March 2002 as the data source for the survey. The main benefits of this database were, that

- it covered SMEs from all sectors and sizes

- it contained the number of employees for each enterprise (which ensured that large enterprises could be filtered out)

- the enterprises in the database are constantly validated by Business Services to ensure that it does not contain too many outdated entries

- it was electronically accessible

Research is often conducted in a specific geographic area, and while choosing a big area like the United Kingdom would cause problems when implementing the qualitative stage of the research as the budget of the research would not allow traveling as much as would be necessary, choosing a very small area, like a city would mean that the findings might only be applied to a very small number of companies. Limiting the study to the North West of England as the geographical area to conduct this research was therefore seen as a good compromise, as it provides a mix of different industries and a mix of rural and urban areas and because the budget of this research is able to cover the cost of travelling within the North West of England. When looking at the latest statistics from the BERR (Department for Business Enterprise & Regulatory Reform 2008) it can actually be seen that the North West of England is actually representative of the United Kingdom as a whole with the attributes measured. The North West of England represents about 10% of the United Kingdom and the mix of industry sectors, company sizes, number or enterprises, employees and turnover is much closer to the UK than that of other areas like London, Northern Ireland or Wales.

The main disadvantage of this database was that it concentrated on the North West of England, specifically on Lancashire and Cumbria and that it contained only 5,800 enterprises, roughly 5% of all enterprises in the North West of England without sole proprietorships and sole partnerships. Although some of the other available databases contained more entries they had disadvantages compared to the UCLAN Business Services database. One factor was that they were too easily accessible, this applied to all Dun & Bradstreet databases and to the Kompass Directories, and a concern was that the enterprises listed in these databases were therefore too often employed for surveys. Using these enterprises that are over exposed to surveys could therefore result in a reduced response rate. Many databases also tend to concentrate on large enterprises or do not contain micro enterprises (Dun & Bradstreet Business Register Lancashire Summer 2001, Dun & Bradstreet Europa 2002). Some of the databases were unsuitable because the data was outdated (Lancashire Business Directory 1999/2000, Database Business Link North and Western Lancashire, Kompass Directory of British Companies 2001/2002). This is a very serious disadvantage. The enterprises might have moved or closed down and if the questionnaires sent to them are not returned as undelivered these companies will be counted as non-respondents although they should in fact not have been included in the sampling frame and can therefore be deleted (Hoinville & Jowell 1977). Another problem with these alternatives is the additional bias as enterprises that are "new" would be missing completely in the survey and therefore limit the findings to "established" enterprises, which might have in general a different attitude towards strategy and e-business.

This section showed that there is no single up-to-date database for UK SMEs, introduced possible databases that could be used as the sampling frame and presented

the database chosen for this research. The problems discussed mean however that the researcher is in a situation where no database is completely accurate and the sampling frame chosen might not represent the population fully as discussed on page 60. This is unavoidable and therefore has to be accepted but taken into account when looking at the results of the study.

4.3 Questionnaire

4.3.1 Distribution and data handling

Introduction

As methodological issues and the implementation of the questionnaire have been covered in the methodology chapter, the following pages will describe the issues that arose when the questionnaire and its questions were developed.

For the quantitative stage of the research it was decided to adopt a survey approach for the collection of empirical data. There are two basic survey types: self-administered questionnaires and interviews (Fink & Kosecoff 1998, p.1). Hussey and Hussey (Hussey & Hussey 1997, p.151-164) also list other data collection methods which are however more suitable for research with different requirements and presuppositions. The survey conducted for this research took the form of a self-administered questionnaire. Clark et al. (1998, p.91) describe questionnaires as more versatile than most techniques but also as having less qualitative depth than some alternatives. They

also write that "the questionnaire is especially good at collecting information on facts and opinions from large numbers of people".

The purpose of this survey was to examine the position of SMEs towards strategy and e-business. This purpose made the questionnaire the best choice to start with as it can provide a picture of the current situation. For the later stage interviews were conducted with selected SMEs that participated in the questionnaire to gain a greater insight into their attitudes towards strategy and e-adoption.

Questionnaire Distribution

The questionnaire distribution consisted of three main phases:

1. Sending out the initial contact consisting of the cover letter (see Appendix II), the questionnaire (see Appendix III), the paper providing extra space for the open-ended questions, the explanations for the questions asked, the list with UK SIC(92) classifications, the "summary of findings" sheet (see Appendix IV) and the pre-paid return envelope.

2. Sending out the first reminder consisting of the first reminder letter (see Appendix II), to all addresses except

   a. those that replied,

   b. those where the initial contact was returned by Royal Mail because the addressee has gone away or

   c. those where the addressee gave notice that the enterprise closed down.

No questionnaire was sent with the first reminder letter. Instead the information necessary to log onto to web version of the questionnaire was included.

3. Sending out the second reminder (see Appendix II) to all addresses except those that replied, those where the initial contact or first reminder was returned by Royal Mail because the addressee has gone away or those where the addressee gave notice that the enterprise closed down. The second reminder consisted of the second reminder letter, the questionnaire, the paper providing extra space for the open-ended questions, the explanations for the questions asked, the list with UK SIC(92) classifications, the "summary of findings" sheet and the pre-paid return envelope.

Data entry

To be able to analyse the collected data in SPSS, the data from all returned questionnaires had to be made electronically accessible. The responses from the companies who filled in the electronic version of the questionnaire were already available electronically, as data stored in a MySQL database. As described in chapter 4.4.1 the data stored in the data base had the same structure that was intended to be used in SPSS, so information from the database could be exported as CSV files and subsequently be imported into SPSS. The data from the responses received in the form of paper questionnaires was put into this SPSS data file. An additional variable was included to store whether the imported data came from a paper questionnaire or a web questionnaire. This enables easy comparison of key differences between answer received by companies who chose different modes for their answers.

4.3.2 Pilot and main questionnaire

The literature review from chapter 2 provided the theoretical context that was necessary to develop the questions used in the questionnaire. The aim of this section is to present how prior research and measures established in prior research were used during the process of developing the questions and creating the questionnaire.

Pilot study

Before the questionnaire was conducted, a pilot study (see Appendix I) as described in the literature (Fink 2006, p. 37; Remenyi et al. 1998, p.151) was prepared and then sent out in February and March 2002 to ten companies, who were known to the University and agreed to take part in the pilot. The main purpose of this pilot was to test design and understanding of this questionnaire, so that the final questionnaire could be understood easily by all respondents since it is not easily possible to clarify problems at a later date with the questions in the self-administered questionnaire. The ten companies used for the pilot were provided with a draft version of the questionnaire concerning their attitude towards e-business and strategies and with the possibility to report on any problems that they had when filling in the questionnaire. The aim was to be able to use the comments of the respondents to improve on the main questionnaire. The two major findings from the pilot study were that

- the original draft was too long and

- an electronic version should be made available for the companies.

The comments proved to be very useful when the final questionnaire was designed. Shortening the questionnaire seemed to be necessary to prevent companies from not completing the questionnaire since this would have resulted in an increase in the number of unusable questions or even in a lower response rate. A new set of questions was created, combining existing questions into a set of more focussed questions addressing e-business and strategy issues more directly.

Providing an electronic version was seen as an added convenience for the respondents and was seen as a useful feature to encourage more companies to respond and improve the response rate. The issues related to the introduction of the electronic version of the questionnaire will be presented in chapter 4.4.

The questions were grouped into three sections, suitable for the researched topic. When asking questions in all three sections Fink's and Kosecoff's (1985, p. 31) rules for avoiding biased words and phrases were taken into account. To be sure that there was no bias despite avoiding biased words and phrases the results were still tested for possible bias, as described in chapter 5.2.

General questions

The questions in the first section of the questionnaire were included in order to find out general information about the companies, as well as information that can be used to classify respondents according to their industry sector and the EU SME definition, so that the results from the research can be easily compared to other studies. This will overcome the problem that there are many different definitions for SMEs in use and researchers often create their own definitions that suit the need of their specific study as discussed in chapter 2.2.

<u>EC Definitions</u>

The Commission Recommendation of 3 April 1996 from the Commission of the European Communities (1996) was the most recent official definition when the research started and was used as the basis for the definition used in the research, especially for the quantitative and qualitative surveys. This definition was chosen because it is the official definition used by member states of the European Union, which makes it easier to compare findings from this study with findings from other studies that used the "official EU definition". In 2003, after the quantitative survey for this research was sent out the Commission of the European Communities adopted a new recommendation regarding the SME definition (Commission of the European Communities 2003) which takes economic developments and other factors into account that had changed since the definition of 1996 and replaced the old definition in January 2005.

The EC Definition from 1996

The Commission of the European Communities (1996) recommended the following definition concerning small and medium-sized enterprises, which replaced all divergent definitions in the member states after 31 December 1997. SMEs are enterprises which have fewer than 250 employees, and have either, an annual turnover not exceeding €40 million, or an annual balance-sheet total not exceeding €27 million, and 25 % or more of the capital or the voting rights are not owned by one enterprise, or jointly by several enterprises, falling outside the definition of an SME or a small enterprise, whichever may apply. This threshold may be exceeded "if the enterprise is held by public investment corporations, venture capital companies or institutional investors, provided no control is exercised either individually or jointly" (Commission of the European Communities 1996), or "if the capital is spread in such a way that it is not possible to determine by whom it is held and if the enterprise declares that it can legitimately presume that it is not owned as to 25 % or more by one enterprise, or jointly by several enterprises, falling outside the definitions of a SME or a small enterprise, whichever may apply" (Commission of the European Communities 1996). Furthermore the European Commission (1996) divides SMEs into medium, small and micro enterprises. Micro enterprises are defined as enterprises having fewer than 10 employees. Small enterprises have fewer than 50 employees, an annual turnover not exceeding €7 million, or an annual balance-sheet total not exceeding €5 million. Medium enterprises are all other enterprises that do not fulfil the micro or small enterprises specification but that do fulfil the SME specifications.

For the purpose of this research the definition of SMEs adopted is similar to this definition which is the official recommendation for the European Economic Area and as

such for UK where this research was conducted and which was also used by other member states to define SMEs, which enables a comparison of the findings from this study with other studies undertaken in the EEA. The definition by the Commission of the European Communities (1996) contains restrictions, mainly to prevent fraud from non-SMEs claiming grants that should only be available to SMEs. Asking questions related to these restrictions would go beyond the scope of this research and the insights gained would not be useful for this research, so the questions asked were restricted to the number of employees, the turnover and the legal form of the enterprise. The size classification and the turnover classification, converted from Euros into Pound Sterling, using the exchange rate of 1.600 € / 1 £ from 3 January 2002 and then rounded off, are used according to this definition.

The definition used for this research takes the number of employees, the annual turnover, and the legal form of the enterprise into account.

E-Business questions

The questions in the second section were asked to find out more about the current e-business situation of the companies and to classify the respondents according to the UK online for business' e-adoption ladder.

Strategy questions

The third section was mainly concerned with the companies' attitudes towards strategies. The first part of this section asked questions related to the technical aspects of e-business. The aim was to find out more about the companies' use of and experience with computers and how they use technology to represent themselves

4.4 Conducting a web questionnaire

As described in chapter 3.4.1 a parallel mixed-mode survey was chosen as the approach for the quantitative data collection. One reason for providing a web version of the questionnaire was the outcome of the pilot as described in chapter 4.3.2. Another reason was the wish to increase the response rate. The web version was therefore made as easy as possible to handle for the respondents.

To ensure that respondents could answer the questions of the web version in the same way as they would answer the paper version, the web version was created to be as similar to the paper version as possible.

4.4.1 Technological aspects

To avoid a possible influence on the answers from different ways of presenting the questionnaire, the layout of both versions was kept as similar as possible. However this

only makes sense if the respondent is able to display the questionnaire as it was intended to be displayed and if replies to the questionnaire can be received as they were intended by the respondent. Using a non-proprietary standard offers some advantages over using a proprietary standard like PDF which makes it harder to use a specific functionality, because it can be implemented differently or sometimes not at all in different versions of Acrobat Reader, the software necessary to use this format. McCalla (2002, p. 59) describes how relying on the implementation of the same functions in different versions of the software causes problems in an on-line survey. Using HTML for the construction seems to be a good choice because, as a non-proprietary standard, there are no hidden revisions that could cause unexpected surprises with different implementations of browsers, the necessary software to display HTML code. Another great advantage is that, since HTML is the format in which web pages are constructed, virtually every computer that can access the web can work with HTML directly, making it unnecessary to use the web for transporting questionnaires in other formats such as PDF or Microsoft Word documents, where the necessary software might or might not be installed in the correct version to work with the files as intended. Using the server side script language PHP, the replies from the World Wide Web questionnaire were saved in a MySQL database from where they could be easily imported into statistical software packages like SPSS via CSV files. Easy exchange between SPSS and the database was further facilitated by using the same structure in the database and in SPSS.

4.4.2 Security

Unlike the paper version of the questionnaire only available to recipients it had been sent to, the World Wide Web version was available on the Internet. Without additional

95

means of security everybody who can access the World Wide Web can potentially access this survey. To ensure that only the selected recipients can answer the questionnaire they were provided with a unique identifier (here called identification number) and a password. Dillman (2000, p.378) suggests a PIN number, which is basically the same as the unique identifier, with the purpose of limiting access. To decrease the risk of successful malicious logins by unauthorised users by just finding a valid PIN number, users additionally had to enter a password that was provided to the selected recipients. The passwords were randomly created numbers between 100 and 999. Numbers were used instead of letters to avoid the random generation of passwords meaningful in the English language. The login mechanism was programmed in a server side script language (PHP). The use of a client side script language was considered, but rejected in order to reduce the risk of users being able to gain access to the system by tampering with the programming code and because it cannot be guaranteed that the correct version of appropriate interpreter, necessary to run the scripts without errors, is installed on the client machine.

4.4.3 Convenience

Check digit

To increase the convenience for the respondents, a check digit was used in the identification number, appended to the company number. The check digit can be used to check for errors after the number has been transmitted (Kirtland 2001, p.5). Using the three digit company number (000 – 999) for the login would cause problems if a respondent mistypes this number together with the correct password, e.g. 156 instead of

165 as the company number. In this case, the system cannot find out whether company 156 tried to log in using a wrong password or whether company 165 tried to log in mistyping the company number. To solve this problem, a check digit was prepended to the company number $a_2a_3a_4a_5$ such that the following equation is satisfied: $(1,3,7,3,1) \cdot (a_1,a_2,a_3,a_4,a_5) = 0 \pmod{10}$. This enables the script to determine whether a user entered a valid identification number or not. If, for example, a wrong identification number is entered, it is very unlikely that this wrong identification number satisfies the prior equation, thus the script is able to determine whether a wrong company number or password has been entered and is able to inform the user accordingly.

Saving intermediate results

After each section of the questionnaire (displayed on a separate page) the answers to the new questions are saved automatically. If a user logs in again after the questionnaire is completed or partially completed, the previous answers will be pre-selected in the questionnaire. This makes it easier for the respondents to correct wrong answers or to continue with the questionnaire if not completed at the previous attempt.

Similarity

As described by Dillman (2000, p.385) "differences in the visual appearance of questions" should be avoided "that result from different screen configurations, operating systems, browsers, partial screens displays, and wrap around".

To ensure that the web version of the questionnaire looked similar to the paper version and that the questions and answers were fully visible, the web version was designed to be fully visible at a screen resolution of 640 x 480 pixels, the lowest resolution commonly used for computers. Dillman (2000, p. 357) states that "a full screen view of a Web questionnaire or a partial (tiled) screen view may affect whether the entire question stem plus categories may be seen without scrolling and whether lines wrap around (break into shorter lengths)." Additionally, the welcome screen of the web version as mentioned by Dillman, Tortora, & Bowker (1999, p. 7) instructed the respondents to use their browser in full screen mode to avoid partial screen displays.

Dillman (2000, p. 360) indicates that "the designer and respondent may see different images because of different operating systems, browsers, screen configuration, tiled vs. full-screen displays, and individual designer decisions (e.g., color and text wrap-around)." To avoid possible bias, several steps were taken to ensure a look as similar as possible on different computers.

As the researcher had full control over the web server, but no control over the respondents' computers, the World Wide Web version of the questionnaire used the server side script language PHP, rather than a client side script language like JavaScript that might result in different results for different respondents, arising from different versions of the client side scripting language interpreter being installed. Additionally the HTML code only contained the most common HTML tags such as <table> and included no tags that are implemented differently or not included in all browsers, e.g. <blink>. The use of colours was restricted to reproducing the look of the paper version of the questionnaire, to avoid problems with different colour palettes on different computers.

The resulting script was tested on different operating systems, including Windows 3.1, different versions of Windows NT, Windows 95, 98, ME, Windows 2000 and Windows XP. It was also tested on Mac OS 9 and different Unix derivates like Linux (Debian, Mandrake and SUSE) with different desktop platforms (KDE, Gnome) and BSD (Mac OS X). Furthermore it was tested on different browsers such as Netscape / Mozilla, Internet Explorer, Opera and OS specific browsers (Konqueror, Chimera). The greatest difference in appearance was noticeable with the latest version of Internet Explorer which provided shaded colours and shadows to create a 3D like appearance of the check boxes and radio buttons in the questionnaire, otherwise the different browsers on different Operating Systems rendered nearly identical web sites.

One design feature used in the paper version of the questionnaire was however not transferred into the web version of the questionnaire: In the web version of the questionnaire, one page represented one logical topic area of the questionnaire (general, e-Business, strategy), not one physical page of the paper version.

4.5 Summary

This chapter looked at the data collection aspects of the quantitative stage of the survey that involve conducting a questionnaire.

This was done by

- providing an overview of the data sources available for the quantitative data collection

- deciding on the data source most suitable for this study

- outlining the questionnaire distribution and data handling

- presenting the findings from the pilot questionnaire and its influence on the main questionnaire

- presenting issues that arise when a web questionnaire is conducted as part of a mixed-mode survey

5 Quantitative Analysis and Findings

5.1 Introduction

This chapter describes how the data collected in the first stage of the research was analysed. The first part of this chapter will look at the preliminary data analysis that was used to explore the data and make better sense of it. The second part of this chapter will discuss the choice of the statistical method that was used to establish the basis for the following taxonomy and the classification of cluster groups itself, to be used as a vantage point for further research.

The replies to the questionnaires were analysed using SPSS version 11 from SPSS Inc. SPSS is a computer package that is used by researchers who conduct quantitative analysis of data and was chosen to be used for this survey because of its suitability for this data analysis, its availability to the researcher, and the availability of literature covering the use of SPSS.

5.2 Preliminary data analysis

Response

Altogether 304 responses were received, 244 (80.3%) on paper and 60 (19.7%) from the World Wide Web. Another 29 questionnaires were returned by the Royal Mail because

the addressee had gone away. The highest number of responses per day were always achieved after a contact was made, supporting Dillman's (2000, p.149) statement that multiple contacts increase the response rate (see Figure 4 Responses). The first contact was made on 21/06/02, the second on 12/07/02, and the third contact was made on 9/08/02). However only 19.7% of the recipients used the opportunity to reply on the World Wide Web with most of these responses submitted as a reaction to the first reminder that contained only the information necessary to fill in the web version of the questionnaire.

Figure 4 Responses over time

Table 16 below shows the statistical significance of differences between respondents using the web questionnaire and those using the paper questionnaire. Assuming a

minimum level of .1 for nonsignificance and a .05 significance level, the size of the enterprise, the economic activities and the use of formal strategies as indicated by the respondents in the questionnaire should have no influence on the choice of mode of response. Enterprises that are using an e-business strategy seem more likely to use the web version of the questionnaire as indicated in the table below where the significance level is less than .01. The level of e-adoption in enterprises also seems to be significant at .057, but due to the fact that chi-square has a tendency to indicate significant differences when the sample size exceeds 200 respondents as in our case (see Hair et al. 1998, p. 655), it could be argued that the influence of the level of e-adoption (the use of e-business as defined by UK online for business) is statistically not significant. Other characteristics of the companies, like size, industry sector, as measured by the UK SIC (92) code, and the use of a formal strategy do not have a statistically significant impact on the mode of response.

Likelihood Ratio Chi-Square	Number of valid cases	Value	Degree of Freedom	p
SME size	291	4.755	3	.191
UK SIC (92)	266	27.106	22	.207
e-adoption	286	9.189	4	.057
Formal strategy	299	3.733	2	.155
e-business strategy	298	12.482	2	.002

Table 16 Statistical significance of differences between web and paper respondents

A higher number of responses was received on the web only after the first reminder, when the respondents were not given a new paper version of the questionnaire but only the details necessary to fill in the web version. The number of responses on the web was low after the initial contact and after the second reminder. It is possible that offering the web version of the questionnaire did not increase the response rate, but only shifted

replies from the paper version of the questionnaire to the web version of the questionnaire, a result similar to the parallel mixed mode survey using mail and telephone by Groves and Kahn, mentioned by Dillman et al. (2001, p. 3).

Bias

There are different ways in which bias can be introduced into a survey, for example the way in which questions are asked, different design methods, and non-response. To address the issue of question bias, all questions included in the survey were posed in a way that tried to avoid bias as much as possible. This issue is discussed further in chapter 4.3.2. As described in chapter 4.3 and chapter 4.4 the design methods were also carefully balanced to avoid bias from the different modes of response. To tackle non-response bias the survey was conducted so that it yields a response rate as high as possible, since one way of reducing bias by non-response is to raise the response rate (Wass 1994, p. 95). This was addressed during the stage when the questionnaire was developed as also described in chapter 4.3 and chapter 4.4.

It is not possible to check for non-response bias directly, since the lack of response means that there is no information available about the non-respondents. Some research suggests however that late respondents can be similar to non-respondents (Dooley & Lindner 2003, p. 108; Filion 1975, p. 492; Stoop 2004, p. 29; Wass 1994, p. 107) and studies in similar areas to this research have used this approach to check for non-response bias (Goode & Stevens 2000, p. 137).

As established earlier there is a difference between companies who answered by mail and companies who answered online. This makes it impossible to draw valid conclusions from a comparison of overall early respondents and late respondents. Instead the issue of non-response bias is examined by looking at early respondents and late respondent for the two modes of response separately.

Non-response bias mail survey

To test for non-response bias the earliest and the last 30 respondents who replied by mail to the survey were compared. As described by Wass (1994, p. 108) "comparing the extremes of the distribution of response times provides a more rigorous test of homogeneity between early and late respondents". The chosen variables were the turnover of the company, the position of the company within the a-adoption ladder and the company's use of formal strategies.

It was necessary to collapse the turnover and e-adoption categories to comply with the χ^2 requirements of having not more than 20% of all cells with an expected count of less than 5. Because it was not possible to collapse the formal e-business strategy category in a way that provides less than 20% of all cells with an expected count of less than 5, it could not be included in the examination of the influence of non-response bias, even though the formal e-business strategy variable is relevant for the purpose of this research.

The distribution of characteristics across early and late respondents can be seen in Table 17. With the assumption that late-respondents behave like non-respondents the table shows that the time of response is independent of the attributes of the companies.

	Early respondents	Late respondents
Turnover		
Less than £ 1 Million	16	12
Between £ 1 Million and £ 4.5 Million	10	9
More than £ 4.5 Million	4	8
Total	N = 30	N = 29

The calculated χ^2 value 1.941 is less than the critical value of 5.991

(2 degrees of freedom, .05 significance level)

e-adoption ladder		
No e-business	4	7
e-mail	11	8
Website or higher on ladder	12	14
Total	N = 27	N = 29

The calculated χ^2 value 1.376 is less than the critical value of 5.991

(2 degrees of freedom, .05 significance level)

Formal Strategy		
No	13	14
Yes, verbally defined	10	4
Yes, written down	7	11
Total	N = 30	N = 29

The calculated χ^2 value 3.481 is less than the critical value of 5.991

(2 degrees of freedom, .05 significance level)

Table 17 Distribution of characteristics across early and late mail respondents

As reported earlier in this chapter there were 60 respondents who filled in the web version of the questionnaire. As in the examination of characteristics across early and late mail respondents the examination of the web respondents will also look at the earliest and the last 30 respondents. Since there were only 60 web respondents altogether the examination will however not examine the extremes of the distribution of

response times, but simply the early half and the late half, again assuming that late-respondents are similar to non-respondents.

The same variables as in the examination of the mail respondents were chosen, namely the turnover of the company, the position of the company within the e-adoption ladder and the company's use of formal strategies.

For the web respondents it was necessary to collapse all three categories to comply with the χ^2 requirements of having not more than 20% of all cells with an expected count of less than 5. As in the previous examination the e-business strategy category could not be examined, because the extreme distribution of answers meant that even through collapsing it was not possible to increase the expected count of enough cells to carry out valid statistics.

The distribution of characteristics across early and late respondents can be seen in Table 18. With the assumption that late-respondents behave like non-respondents the table shows that the time of response is independent of the attributes of the companies that replied online.

	Early respondents	Late respondents
Turnover		
Less than £ 1 Million	16	13
Between £ 1 Million and £ 4.5 Million	4	9
More than £ 4.5 Million	10	7
Total	N = 30	N = 29

The calculated χ^2 value 2.747 is less than the critical value of 5.991

(2 degrees of freedom, .05 significance level)

	Early respondents	Late respondents
e-adoption ladder		
No e-business	3	8
e-mail	9	9
Website or higher on ladder	15	10
Total	N = 27	N = 27

The calculated χ^2 value 3.273 is less than the critical value of 5.991

(2 degrees of freedom, .05 significance level)

	Early respondents	Late respondents
Formal Strategy (2x2 table)		
No	14	14
Yes	11	12
Total	N = 25	N = 26

The calculated χ^2 value .024 is less than the critical value of 3.841

(1 degree of freedom, .05 significance level)

Table 18 Distribution of characteristics across early and late web respondents

Size class	No. of enterprises	% of enterprises	Criteria
Micro	69	22.7 %	(Employees < 9) and (Turnover < 4.5 M £)
Small	141	46.4 %	((Employees ≥ 10) or (Employees < 49)) and (Turnover < 4.5 M £)
Medium	70	23.0 %	((Employees ≥ 50) or (Turnover ≥ 4.5 M £)) and ((Employees < 250) and (Turnover < 25 M £))
Not an SME	14	4.6 %	(Employees ≥ 250) or (Turnover ≥ 25 M £)
Insufficient information	10	3.3 %	

Table 19 Size classification of enterprises

The preliminary analysis of the data examined frequencies and suggested several important findings:

- SMEs neglect e-business strategies

- They enter the e-business arena without careful planning.

- The choice of strategic models, if any, is to a large extent, confined to the use of one model.

The analysis of the data indicates that SMEs neglect e-business strategies even more than their normal business strategies: 50.5% of enterprises had no business strategy, 20.9% had a verbally defined business strategy and only 26.7% wrote their business strategy down (see table 2). Although only 28.5% of the enterprises answered that they do not undertake any form of e-business (see table 3) 85.9% of the enterprises had no e-business strategy at all, only 6.9% had a verbally defined e-business strategy and a further 5.1% a written down e-business strategy (see table 2).

	% with a formal strategy	% with a formal e-business strategy
No	50.9	86.2
Yes, verbally defined	20.8	6.7
Yes, written down	25.1	3.5
No reply	3.2	3.5
Total	100	100

Table 20 Strategies in SMEs

Although there are fewer enterprises with an e-business strategy the relation between size of the enterprise and use of strategy / e-business strategy shows a similar pattern: Larger enterprises are more likely to develop both formal strategies and e-business strategies than smaller enterprises (see Table 21). The larger the enterprise, the more likely it is to have a formal strategy or e-business strategy. Medium sized enterprises were about twice as likely to have a strategy or an e-business strategy as micro enterprises.

Formal strategy	Enterprise size in %			Formal e-businss strategy	Enterprise size in %		
	Micro	Small	Medium		Micro	Small	Medium
No	69.7	50.0	40.3	No	95.5	89.4	86.6
Verbally defined	16.7	22.0	25.4	Verbally defined	3.0	8.3	9.0
Written down	13.6	28.0	34.3	Written down	1.5	2.3	4.5

Table 21 Use of strategy by SME size

The SMEs that have a formal strategy use existing well-known strategic models (see Table 22). SWOT as the simplest and most well-known strategic model is used most

often by the SMEs, followed by critical success factors and PEST. Useful strategic models like the value chain analysis and the five forces analysis that are frequently taught are hardly ever used. It could be useful if a model, that helps the SMEs to develop an e-business strategy, is similar to the models SMEs are already familiar with.

Model . (multiple selections possible)	% of cases
SWOT	67.1
Critical success factors	19.7
PEST	18.4
Business Excellence Model	14.5
Others	11.8
Value Chain Analysis	11.8
Five Forces	7.9
Product Portfolio Analysis	6.6
Balanced Scorecard	3.9
Total	161.8

Table 22 Use of strategic models

5.3 Classification of cluster groups

5.3.1 Introduction

Everitt, Landau & Leese write that "cluster analysis is a generic term for a wide range of numerical methods for examining multivariate data with a view to uncovering or discovering groups or clusters of homogeneous observations" (Everitt, Landau, & Leese 2001, Preface). Hair et al. provide a similar description when they explain that cluster

analysis is a class of multivariate statistical methods that tries to group into clusters by trying to "maximize the homogeneity of objects within the cluster while also maximizing the heterogeneity between the clusters" (Hair et al. 1998, p.470). This statistical method is used by the researcher to discover the structures within the population that create the groups.

Aldenderfer, Blashfield, & Roger mention four different principal goals that can be reached when using cluster analysis, namely:

"(1) development of a typology or classification

(2) investigation of useful conceptual schemes for grouping entities,

(3) hypothesis generation through data exploration, and

(4) hypothesis testing, or the attempt to determine if types defined though other procedures are in fact present in a data set" (Aldenderfer, Blashfield, & Roger 1984, p. 9)

This research will use cluster analysis to develop a classification as described in the first goal. In the more qualitative stage of this research the classification generated at this stage can then be explored further.

Cluster analysis has been used in the area of business strategies for many years. Numerous studies exist that develop taxonomies using factor or cluster analysis (Chang et al. 2003; Dess & Davis 1984; Ketchen & Shook 1996; Kim & Lim 1988; Lawless & Tegarden 2001; Wright et al. 1991). Even though taxonomies are not yet very common in the relatively new area of e-business research, there have been studies applying cluster analysis in the area of information technology, e-business and even e-business

strategies in recent years (Bergeron, Raymond, & Rivard 2004; Brousseau & Chaves 2005; Cagliano & Caniato 2003; Kim et al. 2004).

As described previously, including chapter 4, a questionnaire was developed that collected data on the SME's use of e-business and strategies. The data collected from the survey can so far be grouped according to specific characteristics of the respondents, e.g. their use of strategy. This will however only take one specific characteristic at a time into account. The objective of cluster analysis is to group "respondents or cases with similar profiles on a defined set of characteristics" (Hair et al. 1998, p.88) and was used to take several characteristics of the responding SMEs into account to classify them into groups with similar attitudes towards

- the use of a formal general strategy

- the use of a formal e-business strategy

- the adoption of e-business technology

Even though not all the questions asked were appropriate for use with cluster analysis and to explore these characteristics, some key questions were included to specifically measure these attitudes in a way suitable for use with cluster analysis.

It was possible to ask the companies directly about their formal general strategy and their formal e-business strategy. When it comes to their adoption of e-business technology it was decided to ask the question using the dti's e-adoption ladder (DTI 2002). Recently linear stage models for SMEs and their Internet adoption, like dti's e-adoption ladder have been criticised in academic literature (Alonso Mendo & Fitzgerald 2004a; Alonso Mendo & Fitzgerald 2004b; Levy & Powell 2003) for being too simplistic, however even with these latest critiques, choosing the dti's e-adoption ladder

in the questionnaire and as a variable for the cluster analysis is still believed to be a good choice, because it provides a good general idea of the current use of e-business in the SME. The aim at this stage was not to model growth in SMEs.

As described earlier in chapter 4.3.2 the questions in the questionnaire were divided into three different sections. The main purpose of the first section was to find out whether the company of the respondent would be classified as an SME according to the Commission of the European Communities (1996). The second section was concerned with questions about the companies' e-business engagement and the last section contained one part about the companies' general strategies and one about the companies e-business strategies. Cluster analysis tries to compare objects, in this case SMEs, by comparing the variate, i.e. variables describing their characteristics. The variables used for the cluster analysis were therefore taken from the e-business, the strategy and the e-business strategy part of the questionnaire. While other multivariate techniques estimate the variate empirically, cluster analysis uses the variate as it has been specified by the researcher (Hair et al. 1998, p. 473). The specific variables taken from the collected data were variable b114 ("How would the enterprise be classified in the e-adoption ladder used by UK online for business?"), variable c101 ("Does your enterprise have a formal strategy?") and variable c201 ("Does your enterprise have a formal E-Business strategy?"). As not all companies provided enough answers in the questionnaires only 249 of the companies could be included in the cluster analysis.

5.3.2 Procedure for cluster analysis

The sampling adequacy and the overall significance of all correlations were ensured by testing the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity.

When using cluster analysis there are many different choices to make that will have an influence on the way objects are grouped together. Current versions of SPSS, e.g. version 13, provide four basic choices for the statistical classification. TwoStep, k-means, hierarchical and discriminant analysis. TwoStep cluster analysis was not available in the version of SPSS used at the time of analysis and as a new way of clustering is also not yet covered in the literature about cluster analysis (e.g. Aldenderfer, Blashfield, & Roger 1984; Anderberg 1973; Everitt, Landau, & Leese 2001; Hair et al. 1998; Tacq 1997; Tryon & Bailey 1970).

K-means cluster analysis was originally introduced by MacQueen and will determine clusters by assigning data units, the SMEs, to the clusters and by then recomputing the centre of the clusters and reassigning the data units again until the data units will not change clusters anymore (Anderberg 1973, p. 162). The main problem in the context of this research is that there is not enough information to determine how many clusters will be needed to create a useful taxonomy. The clusters should exist in the data itself and should not have been imposed by the researcher. In this context Bailey writes about the difference between natural and artificial clusters. While artificial clusters can be used to compress a sample, natural clustering tries to identify clusters that occur empirically, i.e. naturally in the sample (Bailey 1994, p. 41). Even though concerns have been raised in the academic community that natural clustering cannot exist and is created by the

115

algorithm of the clustering technique (Bailey 1994, p. 41; Bailey 1975, p. 76) natural clustering is being used heavily in research (Aldenderfer, Blashfield, & Roger 1984, p. 35; Everitt, Landau, & Leese 2001, p. 67) as the number of clusters in artificial clustering has no empirical basis.

Using discriminant analysis for this research would cause similar problems as k-means cluster analysis did. While the k-means cluster analysis is not able to help finding the number of clusters, discriminant analysis requires an initial partition where it would reassign objects to, meaning that the groups would have to be known in advance (Anderberg 1973, p. 155; Norušis 1993, p. 83). If the findings from this research are expanded in the future, discriminant analysis could be used to determine how new SMEs should be assigned to the existing clusters, but it is not a useful tool to identify clusters in our data set.

Hierarchical cluster analysis tries to find a solution to the problem of clustering the objects together by creating the clusters stepwise (Hair et al. 1998, p. 471; SPSS Inc. 1998, p. 305). There are different ways of creating these clusters, with agglomerative methods combining objects into clusters , and divisive methods separating objects into clusters (Anderberg 1973, p. 132; Bailey 1994, p. 40; Kaufman & Rousseeuw 2005, p. 44). Cluster analysis and their mechanics are an inexhaustible area and discussing them in detail would go beyond the scope of this thesis. Because the agglomerative methods are the dominant method and are used in real world research much more often (Aldenderfer, Blashfield, & Roger 1984, p. 35; Everitt, Landau, & Leese 2001, p. 67) attention will be given to the hierarchical agglomerative methods.

5.3.3 Identification of cluster groups

The agglomeration schedule (Table 23) and the dendrogram (Figure 5) were used to try to make better sense of the data and to explore the results of the cluster analysis as described in the literature covering cluster analysis (Aldenderfer, Blashfield, & Roger 1984; Norušis 1993, p. 90; SPSS Inc. 1998, p. 53). The coefficients presented in the agglomeration schedule can be used to help in the decision on how many clusters should be chosen to represent the data (Norušis 1993, p. 90). Similarly the dendrogram can be used to display combinations of clusters that occurred during the different steps of the hierarchical agglomerative cluster analysis (Norušis 1993, p. 91) and "can be used to assess the cohesiveness of the clusters formed and can provide information about the appropriate number of clusters to keep" (SPSS Inc. 1998, p. 313).

Figure 5 Simplified dendrogram after combination of low distance clusters

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	221	249	.000	0	0	28
⋮	~	~	~	~	~	~
223	4	5	.000	212	215	242
224	116	244	.505	0	0	234
225	9	30	1.010	0	0	232
226	28	45	1.684	0	181	228
227	23	220	2.568	209	0	235
228	28	207	3.709	226	0	234
229	70	95	4.921	166	29	233
230	11	39	6.134	176	101	235
231	38	172	7.346	57	50	237
232	9	27	9.341	225	203	237
233	48	70	12.169	23	229	244
234	28	116	15.191	228	224	239
235	11	23	19.765	230	227	239
236	19	57	24.960	191	157	241
237	9	38	32.274	232	231	243
238	1	2	40.071	219	221	241
239	11	28	50.491	235	234	244
240	7	21	62.311	216	208	243
241	1	19	80.196	238	236	246
242	4	13	98.462	223	217	245
243	7	9	124.430	240	237	246
244	11	48	157.926	239	233	248
245	3	4	232.251	222	242	247
246	1	7	312.804	241	243	247
247	1	3	489.659	246	245	248
248	1	11	744.000	247	244	0

Table 23 Abbreviated agglomeration schedule after combining low distance clusters

When exploring the collected data the dendrogram and the agglomeration schedule can be useful tools to identify potential problems in the structure of the data or in the data itself. Because the choice of clusters in this stage will influence all following stages of the research, the correct use of statistical methods is of particular importance. After choosing the variate (see 5.3.1) and the methods and procedures of the cluster analysis,

it is necessary to decide on the number of groups to come out of the cluster analysis. Because of the complex nature of this multivariate technique this is a decision that can not be made by the algorithms (Aldenderfer, Blashfield, & Roger 1984, p. 53; Hair et al. 1998,p. 477), but the output from the statistical analysis, including dendrogram and agglomeration schedule can be used to support the researcher in this decision.

Choosing a solution with many clusters will result in each cluster describing very specific sets of companies. There is however little to be gained when discussing these clusters, as the high number of clusters means that each single cluster only contains very few companies. Descriptions of these clusters might not be very different from describing the individual companies themselves and the fact that there are few companies in each cluster means that it is difficult to argue that the findings from this cluster are generalisable. At the other end of the cluster analysis would be a solution with very few cluster groups. Then the difference between companies grouped together can be very large, which means that the descriptions of these groups would generalise too much and any behaviour or business strategies described will not adequately represent individual companies within this cluster group.

Before determining the number of clusters for the final solution the dendrogram and the agglomeration schedule were used in an attempt to identify outliers in the cluster solution. As described by Hair et al. (1998, p. 506) "the dendrogram permits a visual inspection for outliers, where an outlier would be a 'branch' that did not join until very late". Similarly the agglomeration schedule provides similar information by showing when joined clusters first appeared, which makes it possible to identify clusters that are joined at a very late stage of the clustering process (Hair et al. 1998, p. 506).

While Figure 5 shows that the branches coming from the cluster groups I, J and K join the 'trunk' very late, the companies that make up these branches are not unreasonably different from the rest of the companies. This can also be seen in Table 23 and in the unabbreviated dendrogram (see Appendix IX) and in the unabbreviated agglomeration schedule (see Appendix X). The choice of the variate made sure that no objects, i.e. companies are too different because it can be ensured that all possible combinations of attributes can be checked for reasonability. All possible combinations of answers to the questions that make up the variate make sense for the situation of the SMEs. Companies from the branches A to E will be more similar to the ones from the branches F to H, than to the companies from the branches I to K. The reason why the cluster groups coming from I, J and K join the other cluster groups so late and exhibit more distance to the other groups is because those are the groups of the companies that do have an e-business strategy, which means their variate is fundamentally different.

The agglomeration schedule and the dendrogram seem to support a five cluster solution. A solution with less clusters would mean that clusters with a large distance measure, expressed by the squared Euclidean distance between them (labelled coefficients) would become too big. A four cluster solution would be possible, but would not be sensible, since two of the clusters will be joined in parallel stages. As shown in Table 23 the combinations from stage 245 and 246 are both followed by stage 247, the three cluster solution, also shown in Figure 5 at the rescaled distance number 8. This means that a solution with less cluster would result in a solution with three or less clusters. When looking at the attributes of the companies that would be combined in such a solution it becomes obvious that fewer clusters would be not be beneficial for this research, as SMEs with very different attributes would be combined. SMEs that use business strategies and exhibit a high implementation of e-business technologies (Cluster 4)

would be combined with SMEs that use business strategies but are at the beginning of the e-adoption ladder and have not yet implemented any technologies related to the Internet or have only started using e-mail in their business (Cluster 1). At the same time a three cluster solution would also combine SMEs that do not make use of business or e-business strategies or the Internet at all (Cluster 2) with SMEs that do not use business or e-business strategies, but have started introducing Internet technologies into their business (Cluster 3). A solution with less clusters does therefore not seem to be beneficial for this study.

A solution with more clusters would split the group of SMEs that is already the smallest group (Cluster 5) up even further. The reason is that this group already exhibits a very unusual attribute compared to the rest of the sample, as it is the only group that makes use of e-business strategies. Creating more groups would mean dividing this small group further depending on the formality of the e-business strategy, i.e. whether the e-business strategy has only been verbally defined or whether it has been written down. This would result in a solution where some groups contain ten times as many SMEs as other groups and where the level of formality when deciding on the e-business strategy will divide companies into different groups even though the fact that they use e-business strategies at all already sets them so far apart from the other SMEs. A solution with more clusters does therefore not seem to be beneficial for this study.

All the aids available to the researcher point to a five cluster solution. It is the only solution where clusters have been combined that are not too different, meaning the distance between them does not get too big and the SMEs contained in each cluster exhibit similar properties. At the same time it is the only solution where clusters with

similar attributes are not unnecessarily split up even though they have enough internal coherence (See Figure 6) and common strategies are still preserved

Figure 6 Coefficients of combined clusters

The data suggests that the SMEs can be grouped into five different clusters (see Table 24), according to their adoption of e-business technology and their use of general business and e-business strategies, that can be classified as follows:

The e-business strategy leaders.

This group is the only group containing SMEs that use e-business strategies. The SMEs in this group belong to the SMEs with the longest experience with technology used for e-business and with a very high standard in their use of technology used for e-business. The SMEs in this group do not only use e-business strategies, but all except one do also make use of formal strategies. Their level of e-business adoption is very high, only surpassed by the SMEs that are part of the e-adoption leader group.

123

The old fashioned SMEs.

The SMEs in this group are neither using business strategies nor e-business strategies and they do not use any kind of e-business technology. They do business more locally, have fewer regional / national / international customers and suppliers than average SMEs and they have the smallest use of technology. SMEs in this group were more often than usual part of the health and social work industry or involved in other community, social and personal service activities. SMEs in this group were also more often part of very traditional industries, e.g. manufacturers of wood or wooden products. No SMEs within this group were located in the UK SIC(92) Section "K", "Real estate, renting and business activities", even though all other groups had SMEs in this Sector.

The blind e-business users

The blind e-business users have no business strategy and no e-business strategy but despite this they are still using e-business technology. On the DTI's e-adoption ladder these SMEs are on the first or second rung, either using e-mail or having started a web site.

The e-adoption leaders

The e-adoption leaders have the highest level of e-adoption without having an e-business strategy. They have a high technological standard and the highest use of

124

technology for their work. This group contains SMEs without a formal business strategy as well as SMEs with a formal business strategy.

The formal strategy leaders

The formal strategy leaders use business strategies but no e-business strategies and their level of e-adoption is generally low, as more than half of them are using e-mails, but none of them has a web site. Even though they have the technology available they have the lowest use of technology by their employees. SMEs from the areas of food / beverage / tobacco manufacturing, real estate, renting and business activities, and health and social work are overrepresented in this group. This could be due to the fact that these sectors are highly regulated, which might cause the SMEs to be used to formal procedures as well as a formal strategy planning process.

Cluster	% of cases	Number of SMEs
E-business strategy leaders	9.6	24
Old fashioned SMEs	21.7	54
Blind e-business users	29.3	73
E-adoption leaders	18.1	45
Formal strategy leaders	21.4	53

Table 24 Cluster analysis

Further interesting findings are related to the current level of adoption of e-business in SMEs. Most enterprises started adopting some form of e-business, if e-mail and websites can be seen as an initial step in the e-adoption process (see Table 25). Only 28.5% of the enterprises replied that they do not do any form of e-business. A large number of enterprises are using e-mail (25.6%) or they have a website (33.9%) but only

125

3.6% classify themselves as e-commerce users and only 2.2% classify themselves as e-business users. None of the enterprises sees itself as a transformed organisation, the final stage in the dti's e-adoption ladder. This finding is consistent with the findings from other studies that show that SMEs are still in the early stages of e-adoption in Europe (Peet, Brindley, & Richie 2002, p. 340; Ritchie & Brindley 2005, p. 206) as well as outside Europe (Lawson et al. 2003, p. 269).

	% of responses
No e-business	28.6
e-mail	25.4
Website	33.6
e-commerce	3.9
e-business	2.1
Transformed organisation	0
No reply	6.4
Total	100

Table 25 E-adoption

The SMEs that started using e-business seem to keep their commitment to the web separate from their normal work. More than half of these SMEs outsourced the creation of their web presence (see Table 26). In higher stages of the dti's e-adoption ladder when old business processes should be redefined with the aid of technology it could however be useful to integrate these outsourced activities into the normal business activities.

Creation web presence	% of cases (multiple selections possible)
External company	58.4
Dedicated staff	18.3
Don't know	11.0

Staff, additionally assigned to this task	10.5
Staff from a related department	5.0
Partnership	3.7
Total	106.8

Table 26 Creation of web presence

Although most of the results from the data analysis are not surprising there was no empirical research in academic literature that combined SMEs and e-business strategies. The findings clearly indicate that SMEs generally neglect e-business strategies even more than normal business strategies and that the SMEs can be classified according to their similarities regarding their business and e-business strategy and their adoption of e-business technologies. This classification created from the data analysis will allow their different situations to be taken into account and can be used as a starting point for the development of a model.

5.4 Summary

This chapter contained a preliminary data analysis and the classification of cluster groups.

For the preliminary data analysis the difference between web and paper questionnaire respondents was investigated and the survey was checked for bias, with an emphasis on non-response bias.

After it had been shown that there was no bias in the survey data, the attitudes of the SMEs towards e-business and strategies were examined and three important findings were discovered:

- SMEs neglect e-business strategies

- SME start e-business without careful planning.

- The choice of strategic models is usually confined to the use of one model

Cluster analysis was then used to classify the SMEs according to their e-adoption and their use of business and e-business strategies. A five cluster solution was discovered and an investigation of the attributes of these clusters led to the SME classification with the following groupings:

- Blind e-business users

- Old fashioned SMEs

- Formal strategy leaders

- E-adoption leaders

- E-business strategy leaders

6 Qualitative interviews

6.1 Introduction

This chapter describes the second, qualitative stage of this study, which consists of the data collection, in the form of the interview process, the interview analysis and the findings from the interviews.

It starts by presenting the pilot interviews and their influence on the main interviews.

The outcome of the previous chapter, namely the five groups discovered in the cluster analysis, is used as the starting point of the interview analysis. The analysis includes a presentation of the companies interviewed from the five different groups.

In the end the findings from the interview stage are presented.

6.2 The interview process

6.2.1 Company selection

As described in the Methodology chapter, the analysis of the findings from the first, quantitative stage informed the choice of companies interviewed in the second, qualitative stage of the research. The data analysis found that there are five distinct clusters that differ in terms of their adoption of e-business technology, their use of general business strategies and their use of e-business strategies.

Using the recommendation by the Commission of the European Communities (1996), the companies in the different clusters were further grouped into Micro, Small and Medium sized companies, according to the answers they provided in the questionnaire during the first stage. As discussed earlier medium sized enterprises will have different requirements for their e-business engagement and their strategies, compared to small or micro sized enterprises, so this additional grouping was useful for choosing the participants for the interviews, in order to get a better understanding of the situation for companies in the different groups. The number of companies in each of the resulting 15 groups range from three to 33 (see Table 27).

	micro (up to 9 + turnover < 4.5M)	small (10 - 49 e + turnover < 4.5M)	medium (50 - 249 + turnover < 25M)
Formal strategy leaders	6	33	14
Old fashioned SMEs	16	30	8
Blind e-business users	24	33	16
E-adoption leaders	13	19	13
E-business strategy leaders	3	13	8

Table 27 E-adoption strategy classification and SME size

Since the next stage of this research is qualitative, data collection took the form of interviews which were conducted with companies in each of those 15 groups. There was no reason to study the groups that contain more companies in greater detail, as there might have been in a more quantitative approach, because the qualitative stage will look at the individual companies' situations. The aim was to choose two companies from each group to give a broader viewpoint of the different circumstances in each group than would be possible with only one interview per group. It was also decided not to

interview more than two companies per group to allow more time and depth with those interviewed.

6.2.2 Pilot and main interviews

Preparation

Analogous to the quantitative stage, a pilot was also conducted in the qualitative stage. Even though the necessity of a pilot seems to get discussed more often in books about quantitative research, it is none the less also important in qualitative studies. Wengraf (2001, p. 187) and Wilson (1996, p. 103) emphasise the importance of piloting the data-collection instruments in the context of qualitative studies. The decision to use semi-structured interviews even increased the importance of the pilot. Since semi-structured interviews are based on the premise of the interviewer guiding the interviewee through the interviews, it was important to make sure that the questions did not change too much during the implementation of the interview stage. This meant that the questions had to be refined during the pilot, so that they could remain unaltered during the main interview stage. As described by Wilson "the pilot sample must be representative of the variety of individuals which the main study is intended to cover" (Wilson 1996, p. 103). In an attempt to keep the pilot study as small as possible, it was decided to conduct the pilot with five companies, one from each cluster as described previously in Table 24 Cluster analysis. Using fewer companies would mean that pilot interviews would not be conducted in all clusters. Since the attitudes of the companies are however potentially different between companies in different clusters, it was felt that conducting five interviews was acceptable to provide a minimum level of representativeness. The

clusters contain different numbers of companies, ranging from 26 in the e-business strategy leaders cluster to 76 in the Blind e-business users cluster. This meant that the number of possible candidates for the pilot is limited. Even though all companies in these clusters were willing to participate in the first quantitative study and filled in the questionnaires, it was not clear how many companies would participate in the qualitative stage and would agree to be interviewed. Aware of this fact, it was felt that one company per cluster must suffice to avoid 'using up' too many potential companies for the real interviews in the pilot. Therefore it was decided to stick with the first decision to conduct five interviews for the pilot stage.

Recording and transcribing

As described by Heritage (1984, p. 238) recording the conversation is essential. It enables repeated and detailed examination of the data which extend "the range and precision of the observations which can be made" (Heritage 1984, p. 238). Healey and Rawlinson also mention that this "enables the finished report to be enlivened with extended direct quotes" (Healey & Rawlinson 1994, p. 139). Other advantages include the fact that the data can be analysed by other researchers and that the data can be used for other studies, once recorded. Additionally to audio-recording the interviewer also made notes in case the recording equipment failed, as suggested by Bryman and Bell (2007, p. 490). Because of the unfamiliarity with shorthand this was however only an emergency solution, not a real alternative to the audio recordings.

After the interviews were conducted the recorded material was transcribed to facilitate easier qualitative data analysis. Even though transcribing the interviews is time

consuming (see Healey & Rawlinson 1994, p. 139) as well as costly and difficult (Fasick 1977, p. 549), the benefits of recorded interviews as described in the previous paragraph still outweigh the disadvantages that go hand in hand with the transcription of the interviews. The process of transcribing the audio-recorded interviews into an electronic text format also provided the advantage of making the researcher more familiar with the interviews, since each interview had to be copied onto another medium before transcription and because the interviews were replayed numerous times during the transcription process.

Interviewing process

All interviews were conducted by the researcher, also referred to as the interviewer in the following paragraphs. After compiling a list of different companies, together with their size classification and cluster affiliation, the companies were contacted by telephone and asked whether they were willing to participate in the second stage of this research. Usually the interviewer tried to talk to the person who was contacted in the first mail survey, but if the completed mail survey had been returned by another employee then the interviewer tried to talk to this new contact instead. The reason for this was to get answers from the same person who completed the mail survey to avoid any difference in answers because of different interpretations of company facts by different employees. Once an interview appointment was confirmed, a letter with an explanation for the interviewee and a set of instructions, that was supposed to serve as a reminder for the interviewer, were created.

At the beginning of each interview the letter with explanations for the interviewee (see Appendix VI) was handed out and the project was briefly explained to the interviewee. This explanation included a short overview of the research project and in the end the interviewees were explicitly asked again whether they agreed to be recorded and whether they agreed to take part in this study.

The document with explanations for the interviewer also contained the information provided by the company in the mail survey used to originally classify the company into different clusters (see Appendix V). Before starting with the main interview questions the interviewer checked these details with the interviewee, to determine whether the company would still be classified in the same way as in the quantitative study. Once this information was noted the interviewer started to ask the main questions.

Pilot conduction and resulting modifications

As part of the pilot five interviews were conducted in September and October 2003. For the first interview conducted as part of the pilot the questions asked were sketched out roughly on a sheet of paper (see Appendix VII). Some of those questions could be skipped or included depending on whether they were applicable. The list of questions on the sheet also included concepts to keep in mind for the interviewer and possible answers to questions from the interviewee as it was felt that this could help to improve the professionalism of the interview and could help to improve the experience of the interviewee.

The experience from the pilot studies helped to improve the instructions for the interviewer. This was done by analysing the recorded material after each interview in order to find out how questions could be improved to get more relevant answers. The results of these analyses were then fed back into the instruction sheet for the next interview of the pilot study and helped to improve the interviews gradually during the pilot. Since the nature and the business environment of the different SMEs involved varies, the questions being asked were normally adapted to the specific situation of the SME to be interviewed. This meant that questions not applicable were excluded from the beginning, while other questions were sometimes added for specific interviews. At the end of the pilot a set of instructions for the interviewer had been created (see Appendix VIII). This set of instructions was used during the main study and addressed the issues of

- Background and nature of the company

- Role and influence of interviewee / key actor

- Current e-business situation of the company

- Situation regarding e-business strategy

- Process that lead to e-business

- Preparation before e-business introduction

- Expectations, advantages and disadvantages of e-business

- Planning in relation to e-business

- Possible improvements of e-business engagement

The course of the pilot interviews showed that including these issues was helpful in providing answers that lead to a better understanding of the companies' e-business situation and strategy.

Main Interviews

Interviews were conducted between November 2003 and July 2004 using the approach and the questions determined during the pilot study. For each interview the companies were contacted by phone, they were given an explanation letter and a verbal explanation, the interview was recorded and then transcribed. As described in chapter 6.2.1 it was decided to contact two companies from each size classification of each group. Contacting the right person in the companies however raised some difficulties. Some SMEs had to be contacted several times, one SME more than 30 times, two SMEs more than 25 times until the right person to talk to could be reached. Despite all efforts it was not possible to interview two companies for every group's size: Only one micro sized enterprise in the group of formal strategy leaders could be interviewed. One company in this size classification of this group was taken over and the new owner was not interested in participating in this study and other companies were too busy to take part in a face-to-face interview. One of these companies offered to participate if the interview was conducted over the phone, but this offer had to be declined so that no bias was introduced because of the interview method. Another problem arose when the interviewee in one of the medium sized companies agreed on the phone to take part in the interviews and was sent an explanation letter, but when visited on the day and given a verbal explanation he refused to be interviewed unless the interview was not taped. This problem is discussed by Bryman and Bell who write that it is not uncommon for a small number of interviewees to refuse an interview. They mention the example of a researcher who took notes during an interview when the interviewee refused to be taped (Bryman & Bell 2007, p. 490). It was however felt that this condition was not acceptable for this study as not being able to transcribe the interview would result in too

136

much loss of data. The interview was therefore cancelled. Other companies were then contacted in this company's place and in the end two interviews were conducted in this size classification and group. One interview that had to be disregarded as the company was mistakenly put in the wrong cluster. The wrong classification happened when SPSS was updated to a new version by the University. One bug in the new version resulted in SPSS handling certain values in variables in a different way. This resulted in a wrong classification of respondents and was only discovered during the invalid interview, as this bug was not known publicly before.

Altogether 29 valid interviews were conducted for the second stage of the research. This does not include the pilot interviews and the invalid interview. The interviews usually lasted 30 to 45 minutes.

6.3 Interview analysis

Transcribing all interviews generated more than 100,000 words of text. The amount of data that needed to be analysed suggested the use of computer assisted qualitative data analysis software (CAQDAS). As described by Gibbs CAQDA software supports handling text and keeping records of ideas, searches and analyses, but the qualitative analysis and the interpretation cannot be done by the software but has to be done by the researcher (Gibbs 2002, p. 11). NVivo was chosen as the CAQDA software to be used because of its availability to the researcher and the suitability for supporting the analysis of interviews.

As outlined previously the use of quantitative data analysis resulted in the discovery of five different cluster groups, namely Old fashioned SMEs, Blind e-business users, Formal strategy leaders, e-adoption leaders, and e-business strategy leaders. Unlike chapter 5, which was mainly concerned with the statistical, quantitative analysis of the data collected from the questionnaires in the first stage of the research, the research will now look at the individual companies that make up the cluster groups.

During the interviews not all companies were found in the same state as the one recorded during the quantitative stage as shown in Table 28. Some companies grew in size or shrank, some increased their adoption of e-business technologies or changed their use of strategies. It could be argued that this is largely the effect of sequencing the quantitative and qualitative phase of the study as described by Onwuegbuzie and Johnson (2008, p. 291) and is therefore a sequential legitimation issue. The answers given in the interviews indicated however that this mismatch of answers given by the same companies in the different stages was in some cases not due to a change in the company, but due to a different interpretation of the meaning of some questions or some answers. Whenever possible the questionnaire respondent and the interviewee in the qualitative stage were the same person to minimise the effects of different interpretation of questions and answers, but this was not achievable in all cases. The interpretation of the entire analysis showed that this problem also occurred within the quantitative stage. This problem would have also occurred in a quantitative study as some interviews showed that the answers given by the company in the questionnaire were not always accurate. This could indicate that the companies did not check the explanation sheet provided with the questionnaire (see Appendix IV) if they were in doubt about the possible meaning of questions and answers or that they had a different idea of the

138

meaning of strategy or e-adoption, but were not in doubt about the correctness of their idea and did therefore not consult the explanation sheet.

This change of the state of some companies, the main reason being recently increased e-adoption, resulted in the reclassification of several SMEs. The most common reclassification in this research was the reclassifications of several SMEs that were previously classified as old fashioned SMEs, blind e-business users or formal strategy leaders to e-adoption leaders, usually caused by a recent increase in the use of e-business technologies.

As the use of strategy and the level of e-adoption was rechecked at the beginning of each interview the companies could be reclassified according to the e-adoption strategy classification found in the quantitative data analysis. The reclassification always gave a very good idea of the company: PBM for example, previously classified as a blind e-business user, really did match the behaviour of other companies in their new group, e-adoption leader, more than the behaviour of companies in their old group.

	Micro	**Small**	**Medium**
Old fashioned SMEs	WDC ~~HHP~~	FCR ~~GLF~~	RNH ~~PSF~~
Blind e-business Users	RFP ~~PBM~~ RRA [d]	MIE ~~SUC~~	RFC ~~HCS~~ SUC (was small)
Formal strategy leaders	CAD (was small) ~~MDA~~	STE ~~CAD~~	SDS ~~PDC~~
E-adoption leaders	DBG	MCR	IDG

	EDM	CNC	GBC
	PBM[a]	GLF	PSF [c]
	HHP[c]		HCS[a]
E-business strategy	~~RRA~~	EMC	HOT
leaders	~~MFH~~	MFH (was micro)	CAA
	MDA [b]	SLS	PDC[b]
a) was blind e-business user b) was formal strategy leader c) was old fashioned SME			
d) was e-business strategy leader			
crossed out entries indicate SME originally in a cell that moved to another cell			

Table 28 SMEs by size and group

6.3.1 Old fashioned SMEs

SMEs in this group usually do not use any kind of e-business technology and are neither using business strategies nor e-business strategies.

WDC

Name	WDC
Information	Selling windows, doors, conservatories Micro sized enterprise
Market	Local and Regional Very competitive, low profit margins
Drivers	Employee / technology driven
Inhibitors	Nature of business not suitable for real e-business e.g. cannot give price online, like a reseller, because situation has to be examined to determine price for fitting windows
Situation	e-business technologies used previously but stopped when driving employee left as they were seen unsuccessful were not supported by management

Table 29 Old fashioned SME: WDC

WDC, a micro-sized enterprises from the group of old fashioned SMEs, is a vendor of *Windows, Doors and Conservatories* (WDC) competing locally in a very competitive market with very low profit margins. The size of the company means that employees have to be all-round talents who have to be able to do everything.

WDC had a web site and used e-mail in the past, but thought that the money spent on it did not "justify the response from it" (WDC). The introduction of the web site and e-mail had been driven by one specific employee for the sake of technology itself. The management did not believe that the use of e-business technologies will be beneficial for the company: "I was very sceptical. I didn't think it would work." (WDC). This is partly because the tailor-made nature of the business does not permit full e-business implementation. WDC said "In this business they want you to fit the window. You can't give a price for fitting a window over the Internet or over a computer, because you don't know what's involved in fitting that window." (WDC). Therefore the management did

141

not actively support the introduction of these technologies, and even though e-business technologies were used, they were neither embraced by existing customers, nor used by new or prospective customers. WDC suspects that this might be different in the future or in other areas like London and that the non-acceptance by customers has to do with the older age of the customers and the fact that the web is very impersonal: "[Customers] like to deal with people, they like to come in, they like to touch, they like to see, they like to feel, they like to get a feel for the person that they're buying from, and I don't think you can do that on a screen" (WDC). There were also no efforts made to use these new means to communicate with suppliers, while other companies, unknown to WDC, used unsolicited e-mails trying to sell their products and services to WDC. After only two months all e-business related activities, i.e. the web site and e-mail communication, were stopped when the employee who drove the development left the company. WDC did not use e-business technologies since then and even though competitors use e-business technologies WDC has no intentions of introducing e-business technologies again because it believes that e-business is only beneficial for bigger companies in this industry or for companies that resell products, not for companies in the construction sector or in related areas where a deeper implementation of e-business is not easy as information demanded by the customers, like quotations, cannot be given on the web, because the situation has to be individually evaluated by the company. A limited implementation of e-business on the other hand is believed to be of no benefit for the company. Even the use of simple technologies like e-mail is not considered anymore because more traditional technologies like fax machines are perceived to be more beneficial for the company.

When it comes to business strategies in general, outside the scope of e-business, the company also does not plan ahead. WDC states that the volatility, uncertainty and

142

unpredictability of the market prevent them from planning ahead. This hostility of the market is seen by the management as being caused by an economy that is not doing well and by the fact that high house prices and debt of consumers prevent them from buying expensive goods like the ones sold by WDC.

FCR

Name	FCR
Information	Fish'n'Chips restaurant and take away Small enterprise
Market	Local Very competitive
Drivers	Increased convenience
Inhibitors	Unreliability of business partners in this industry who use e-business
Situation	Used e-business technologies for procurement before, but stopped after disappointment

Table 30 Old fashioned SME: FCR

FCR, a small sized SME from the old fashioned SME group is a *Fish 'n' Chips Restaurant* and take-away in a popular seaside resort that depends heavily on tourism and competes with chain restaurants. Like WDC they also tried out using the Internet in the past, but stopped. The Internet had been used to keep up-to-date and to research competitors. Later it was even used to order online from existing suppliers and FCR would have liked to continue to do so, but there were problems compared to traditional procurement methods. The main problem was that the goods that arrived were not meeting the specifications of the goods ordered and had to be sent back, so FCR reverted back to more traditional procurement methods after they experienced these problems on several occasions and the situation did not improve. Even though the Internet had been used for research purposes and for procurement, it had never been

143

used for e-mail communication. Simple decisions like what goods to order are made every four weeks and are written down, but there is no real strategic planning.

RNH

Name	RNH
Information	Registered nursing home Medium sized enterprise
Market	Very local Not so competitive
Drivers	Possibility of compulsory electronic communication
Inhibitors	Technical problems
Situation	No Internet used at all, but their brochure has been published on the villages web site.

Table 31 Old fashioned SME: RNH

RNH, a medium sized SME in the old fashioned SME group is a *Registered Nursing Home*. Even though the nearest competitor is only ten miles away the market is so local that this relatively small catchment area means that there is no real competition as RNH and similar companies do not try to get customers from outside their catchment area. In this market customers are also often funded by various social services departments. In RNH's case about two thirds of all customers are funded this way and one third are funded privately.

In a local initiative a website had been created for the village where RNH is based. For this initiative all local businesses were approached and offered a page on the village web site, so RNH agreed to have the content of their brochure being published on the web site. RNH does not use e-mail yet, but expects to have to exchange data electronically in the future, like income tax, tax returns, pay as you earn, wages and

bank transfers. Lack of specialist skills result in uncertainty about the technical implementation. Together with cost and to a lesser degree the fear of viruses these barriers prevent RNH from actively trying to introduce the Internet access necessary for e-mail. The introduction might be deferred until the data exchange is compulsory because of the company's size. RNH does not believe that the introduction of e-mail would improve communication with employees or customers, as explained by the manager: "it's very much a people business and I mean, nobody is gonna chose a nursing home for their mother by e-mailing and looking on, they're gonna want to come along, meet us and see what we're about, what they... I think it's very much getting a feeling as you come in the building and meeting people and seeing whether you would trust them with your elderly mum." (RNH). RNH does however think that the introduction of e-mail might help in communicating with authorities and suppliers. There is no e-business planning as the manager does not feel that the introduction of e-business technologies will be beneficial, and if e-business has to be introduced because of requirements by different authorities no important benefits are expected. There is no traditional business strategy, but there is some informal planning by the manager alone, set similar to a three year business plan with advice being sought only in some areas from the matron for the nursing side of the business and from the accountant. If introduced, the e-business aspects would also be planned and reviewed as part of this three year plan. RNH does not see e-adoption as important in its industry.

Summary

E-business

Some companies were in the old fashioned SME group after the quantitative stage but increased their level of e-adoption and consequently moved into other groups. Previously WDC and FCR had higher levels of e-adoption, but disappointment and the loss of an IT champion made them fall back to the group of old fashioned SMEs. Their experience makes them reluctant to increase their level of e-adoption. For RNH the lack of skills and insufficient financial resources, two of the biggest barriers to e-business found in a study by Jones, Beynon-Davies, & Muir (2003, p. 15), let them defer the introduction of e-business technologies until it is compulsory for a company of its size, which according to current information might be in 2011 (HM Revenue & Customs 2008).

Strategies

While RNH does very informal, long term planning, FCR make only simple planning decisions and WDC does not plan ahead because of the volatility, uncertainty and unpredictability of its market.

The old fashioned SMEs examined do not actively pursue the introduction of e-business technologies and only do extremely rudimentary strategic planning if at all.

6.3.2 Blind e-business users

Blind e-business users are using e-business technologies even though they do not have a business strategy or an e-business strategy. These companies are frozen at the early stages of e-business adoption

RFP

Name	RFP
Information	Retailer of fire places Micro sized enterprise
Market	Mainly B2C, some B2B Biggest company in local market (20 mile radius), expanding to be biggest in region Market very competitive at the cheaper end, but RFP also occupies some niche markets
Drivers	Offer additional communication channel for customers who prefer this.
Inhibitors	Internet is "tedious" to use and RFP prefers to communicate using traditional ways, not electronically
Situation	Introduction was boss' decision Internet is not used to buy online The company's website is just a brochure, no e-business E-mails not used very much RFP is just setting up another company to be an online retailer and might sell online under the existing name if this new business is successful.

Table 32 Blind e-business user: RFP

Another micro sized company whose answers from the questionnaire placed it originally in the blind e-business users groups is a *Retailer of Fire Places* (RFP). RFP

sells mainly to households, but some of the business is also generated from installing directly for builders into new homes, and from installing for hotels, pubs and breweries. RFP is currently the largest local provider of fireplaces with some regional competition. While two competitors had to close down recently, RFP is even expanding, has purchased more premises recently and will be the biggest regional provider of fireplaces soon. The market is very competitive at the cheaper end, but RFP also occupies some niche markets. RFP is widening its reach by offering niche products through agencies.

Originally the web was introduced without prior planning to make it easier for potential customers to contact RFP, but from the beginning it had just been seen as an additional channel for those who like to use the Internet instead of the telephone or a fax: "contact with yourself should be as easy as possible, so whether that's fax, telephone, Internet, e-mail, you must, you must have 'em, they just got to run hand in hand" (RFP). RFP is using e-mails and they also have a web site, but there are not many enquiries by e-mail and customers also do not use the web site as much as expected. RFP is not sure about the reasons for the low acceptance, but this is not a concern as it is felt that RFP "could survive quite easily without any electronic system, any e-business or e-mail systems" (RFP). E-mail is not being used for internal communication or for external communication with suppliers or to initiate contact with customers, even though very rarely customers would contact RFP by e-mail. RFP's web site is an online brochure and provides information about different products and services offered, without covering the full depth of products available or prices of products. The Internet is also used for research, but is found to be "tedious". Procurement is done traditionally, mainly using fax as most suppliers in RFP's industry are small companies that do not have e-business systems and as half of RFP's orders are bespoke non-standard orders that have to be made to order by the suppliers. The next step towards a deeper level of

e-business adoption would be to e-mail orders, but RFP feel that suppliers "aren't up to it yet, they're not ready" (RFP) yet to receive orders that include plans and drawings for bespoke orders by e-mail.

Currently RFP is setting up another company specifically to compete in this industry as an online retailer. This seems to be part of RFP's expansion as they started to expand while smaller competitors started to disappear. RFP explained that

> "the industry is changing and is going from being a small cottage industry and they are taking on a more professional approach, then there are larger retailers in order to be able to survive, then we need to be big and have more products" (RFP).

Other reasons for expanding by setting up a new company to compete as an online retailer could be entrepreneurial characteristics found in the owner, but also the wish to try e-business technologies in a sand box-like environment where the impact of failure is limited and will not affect the established company. The owner anticipates that this new online retailer will not cannibalise RFP but will instead generate business from a new online market. The Internet engagement of RFP will not be affected and their web site will continue to be an online brochure only. The idea is to monitor how the new online business is working before selling under the existing company name.

When it comes to the normal business strategy the manager explained that there is a silent understanding between him and the staff what they are going to do. The manager knows where he wants to be in twelve months and is constantly looking at what RFP is doing. He does not see any benefits for an e-business strategy for RFP as working out an e-business strategy would be too time consuming, but he thinks an e-business strategy is beneficial for the new company that is being set up for online retailing.

RRA

Name	RRA
Information	Regional recruitment agency Micro sized enterprise Was *e-business strategy leader*, now *blind e-business user*
Market	Regional Niche market
Drivers	Use of e-business technologies for marketing purposes Keeping up with trends and technology
Inhibitors	Technical problems
Situation	Use of e-mail for information exchange (CVs, ...) Use of web site as a brochure

Table 33 Blind e-business user: RRA

RRA is a *Regional Recruitment Agency* and classified as a micro sized enterprise. Originally classified as an e-business strategy leader, the interviews established that RRA only used strategies when they felt that they were necessary during the phase when e-business technologies were introduced. RRA then stopped using strategies for their business and their e-business afterwards to be more flexible.

> "Because we are constantly evolving it wouldn't be feasible [to have a strategy], it wouldn't be practical, would just be a waste of my time and the staff's time because it would, it wouldn't happen, some of it might, but generally speaking there's so much legislation coming through all the time in our business and we just can't be that rigid, that structured." (RRA)

Its web site was introduced after a local newspaper, in which RRA advertised, approached them and offered to host RRA's first web site. The same newspaper was also involved in SUC's initial web site as described on page 154. RRA is also using the Internet extensively for online advertising. E-mail is used to exchange information with the candidates and to get their CVs. RRA adopted e-business technologies early, but

now the majority of competitors use them as well. National competitors are on higher stages of the e-adoption ladder, but RRA feels that it does not need more "interaction on the web for business" (RRA), because it is only a small company.

MIE

Name	MIE
Information	Manufacturer and importer of equestrian products Small enterprise
Market	The main market is very competitive and is getting more so because of international competition, but there are some niche products. The customer base is mainly national with a few international customers.
Drivers	Internet seen as a "tool for the future" (MIE)
Inhibitors	Not used as much as anticipated
Situation	Communicates electronically and sells online MIE wants to advance e-adoption further by providing stock levels online. E-business strategies part of overall thinking that is triggered by certain events.

Table 34 Blind e-business user: MIE

Another blind e-business user which increased its levels of e-business adoption in recent years is MIE, a small company *Manufacturing and Importing Equestrian* products and selling them to retailers. The main market of MIE is very competitive and competition is increasing. Additionally MIE is also manufacturing custom made products for a niche market. MIE's business is mainly national, but there are also some international customers. Manufacturing is not taking place in the UK anymore. Instead products are now manufactured in Asian countries like India or China. This created a new set of problems the company and the industry have to deal with, as products have to be ordered many months in advance which results in a shortage of stock if predictions of

required goods were not accurate e.g. because of a warmer or colder winter than expected that results in people buying different horse rugs than expected. MIE is trying to deal with this situation by encouraging retailers to place orders early, by using statistical methods to predict orders better, and by taking regional trends into account. Manufacturing from Asia also brought disadvantages to MIE in the form of manufacturers copying products, where copies of award-winning products designed by MIE were available on the market within a few months by companies without knowledge of the equestrian industry, but with cheap manufacturing capabilities.

MIE is using e-mail internally and also for external electronic communication with their suppliers and customers, but since many of their customers are very small retailers they do not use e-mail as a "normal tool" (MIE). When MIE orders from its suppliers it usually orders a completely new product. This means that many specifications and descriptions have to be sent and the suppliers create a prototype that has to be approved or modified by MIE. This is a very complex process so documents are sent using e-mail but products cannot be ordered through a web site or an electronic system.

Before introducing a web site MIE looked at competitors and found problems that should be avoided, like outdated information, but since introducing their web site it found out that it is quite difficult to avoid these problems. MIE has a web site highlighting the products with their various features where customers can buy products online, but selling of the products will actually be done by local retailers who are selling MIE's products. The web site was introduced and improved slowly and is not used as much as anticipated by MIE's customers. Retailers in this market are often horse enthusiasts who start selling products like rugs and who do not operate like traditional companies in a sense that they do not pay as much attention to stock levels and profit

margins as a company would do that is running the business primarily to earn money. In recent years there has been an explosion of "horse lovers" who started selling horse products through their web sites. Even though other companies do not use MIE's Internet facilities as much as anticipated, consumers use it often and contact MIE about where and how to buy the products featured on the web site. Demand by consumers increased constantly but because MIE is a member of BETA (British Equestrian Trade Association) it is not allowed to deal directly with consumers. A system was put in place to facilitate MIE selling to consumers despite these restrictions: When consumers buy products online they officially buy the product through a local retailer. MIE is paying a premium for the permission to use the local retailers name but it enables MIE to sell to end users with a slightly increased profit margin.

In the future MIE wants to advance the level of e-adoption further by exchanging data with other major retailers and by allowing them to automatically access certain types of data like stock levels of specific products through the Internet and by offering service to medium-sized retailers, like direct delivery to consumers in their name, so that these retailers would not have to keep high stock levels. This would not however be feasible for small retailers who would not have the systems in place to support this and also not for big retailers who source their products directly from the Far East. MIE does not formally revise these plans, but refers to it as a "rolling situation" (MIE) that is not reviewed at fixed time intervals. Any plans or strategies related to e-business are also not dealt with separately but are "part of the overall thinking" (MIE) that is triggered by certain events, like a new range of products. Overall MIE does not think that creating a more specific e-business strategy is beneficial for a company in its industry.

SUC

Name	SUC
Information	Selling pre-registered cars
	Originally classified as a small enterprise SUC grew recently and would have to be classified as a medium sized enterprise
Market	Local and Regional
	Until recently without competition for sales of cars this age and make. Competitor started appearing one year ago, but despite this business even increased
Drivers	Popularity of the Internet meant they did not want to be left behind
Inhibitors	Initially feared that e-business technology would be too complicated
Situation	e-business technologies outsourced
	previously few control, but started to pull more of the direct control into the company
	use of e-business technologies resulted in more customers

Table 35 Blind e-business user: SUC

Another company classified as a blind e-business user is *Selling Used Cars* (SUC). Originally classified as a small enterprise, SUC's turnover grew so much that it would now have to be classified as a medium sized enterprise.

SUC's main business is selling pre-registered cars. The cars are six months old and all from the same make, but SUC also repair and service cars and sell tires. Their customers are mainly regional. They did not have regional competition in their main segment of the market until recently, but since their competitor opened SUC's business even increased.

SUC started using e-business technologies a few years earlier when a local newspaper hosted their first web site, but to get more control over the web site and to be able to update the site easier SUC moved the hosting of the site to a car magazine, as the old

system did not allow changes to be made directly. The convenience of the new system means that the web site is now updated several times a week. The Internet is seen as an advertising tool only. It is not used for communication with suppliers and communication with customers via e-mail is only done when customers send quesries by e-mail. The Internet is seen as a very successful advertising tool because the web presence generates a growing number of e-mail enquiries and generates sales, but the Internet is not seen as anything more than that. Established forms of communication like telephone calls to the suppliers are seen as more convenient and time efficient than communication using Internet technologies.

When the company started using Internet technologies a few years earlier staff thought using the technology "was going to be too complicated" (SUC) and they lacked confidence as they "were not particularly computer literate" (SUC), a perceived ICT implementation barrier also found in other interviews conducted with SMEs in Europe (Arendt 2008, p. 103). Since then SUC took on a younger employee who is more computer literate because of the age and who has to deal with IT related issues, but SUC still feels that it does not have enough e-business knowledge to have an e-business strategy.

RFC

Name	RFC
Information	Farmer owned cooperative with a farmer base of about 750 members, profit goes back to the farmers Medium sized enterprise
Market	Regional Limited number of potential new members as number of farmers does not increase
Drivers	Use of e-business technologies seen as a must
Inhibitors	Many customers are traditional farmers who do not see a need for e-business technologies, many cannot even be persuaded to use fax for orders
Situation	e-adoption only to web site level as there is limited interest from the farmers who are owners/customers for e-business technologies. e-mail used for external communication

Table 36 Blind e-business user: RFC

Another medium sized blind e-business user is a *Regional Farmer Cooperative* (RFC). As a farmer cooperative RFC sells farm requisites, animal feeds, hardware, fencing posts, fertiliser, and other farmer requisites to a farmer base of about 750 members. RFC is farmer owned and sees the farmers as shareholders who get the money back that was made during the year.

RFC describes the market as a mature market as the number of farmers is not increasing. This also resulted in less competition as "the return on capital is not worth the hassle" (RFC) and some competitors left the market.

RFC has a simple web site with information about the cooperative. The farmers are not interested in using e-mail for communication, but the cooperative is using e-mail for communication with suppliers. In the future it might be possible to integrate RFCs systems with the suppliers' systems, but even though RFC realises that there is a big

potential for savings if systems were integrated there are no plans yet to push this forward.

When it comes to planning and using strategies RFC's e-business has been done "by necessity" (RFC) only: "I don't think we've ever sort of sat down and strategically looked at where we should be going [...] whether that's right or wrong, I don't know, probably wrong, probably something we should plan, just as well as much as plan other things" (RFC).

Summary

<u>E-business</u>

Even though blind e-business users are on the e-adoption ladder and are using e-mail or have a web site they seem to be very cautious and do test e-business very carefully, often without internal drive, as in the case of RRA and SUC who only started their e-adoption when they were approached by the same local newspaper which offered to host their site. RFP wants to test e-commerce but is also careful and moves the risk by setting up another company selling the same products online. It does however think that it "could survive quite easily without any electronic system, any e-business or e-mail systems" (RFP). RFC does not want to increase its level of e-adoption as its customers do not show any interest in e-business technologies. MIE is still classified as a blind e-business user but they want to advance the level of e-adoption further by exchanging data with other major retailers and by allowing them to automatically access certain types of data like stock levels of specific products through the Internet. It is therefore

very likely that MIE will leave the blind e-business user group soon and become an e-adoption leader or because of their attitude towards strategies even an e-business strategy leader.

Strategy

Like the old fashioned SMEs the blind e-business users do not have formal strategies. RFP explained that there is a silent understanding between the manager and the staff when it comes to their business strategy, but there is no benefit in working out an e-business strategy as this would be too time consuming. The situation for RRA is similar, as it thinks that having a strategy is a waste of time and would make the company too rigid. RFC thinks it should plan its e-business, but does not do so at the moment while SUC feels that it does not have enough e-business knowledge to develop an e-business strategy.

The blind e-business users examined seem to be very passive when it comes to the introduction of e-business technologies. They only have rudimentary strategic planning, some because they want to be flexible, some for other reasons.

6.3.3 Formal strategy leaders

Formal strategy leaders are SMEs that do not have an e-business strategy, but have a business strategy and occupy very low levels of the DTI's e-adoption ladder (DTI

2002). Normally they either do not use any e-business technologies or they reach the e-mail stage on the e-adoption ladder.

CAD

Name	CAD
Information	Design Engineering and Computer Aided Drafting Micro sized enterprise (previously small)
Market	Main business is materials handling equipment Regional and national customers, only few international customers
Drivers	The owners used e-business technologies in their previous employment and introduced it in their company because of the convenience and speed it provides
Inhibitors	Technical difficulties
Situation	E-mail is used to exchange information, receive orders, quote prices The web is used to research customers, competitors, suppliers, technical and project information

Table 37 Formal strategy leader: CAD

CAD is a micro sized enterprise in the design engineering and *Computer Aided Drafting* sector. It is classified as formal strategy leaders because it has a written down strategy, but no e-business strategy. When the questionnaire was conducted CAD had 12 employees and was therefore a small enterprise, but when the interview was conducted the number of employees fell to nine employees and CAD is now a micro sized enterprise. Its customers are mainly national but it also has some international customers. CAD competes in a niche market, but even though the market is not very competitive, there are occasionally competitors from other geographical areas competing for the same national contracts.

159

CAD is currently on the first stage of the e-adoption ladder: it is using e-mails to "transmit documents, drawings, correspond with [...] clients, do quotations by e-mail, receive orders by e-mail" (CAD). It is also using the Internet to access the web, but it does not have its own web site yet, even though it has a domain name reserved. When it recently employed a new office administrator it specifically identified the task of developing a web site for this administrator.

CAD is planning its business strategies, but because of time restraints and limited availability of staff it does not have strategies for the e-business aspect of the business. Taking on the new employee who is also responsible for the web site might however lead to the development of an e-business strategy in the future that could be addressed during management reviews.

STE

Name	STE
Information	Provider of shelter time employment service for people with mental health problems Small enterprise Funded by the NHS STE has an IT department where clients can gain qualifications in IT
Market	Another local company, a charity, is also providing similar mental healthcare Customers of products produced by mental healthcare clients are local and regional, some are national
Drivers	Need for communication with NHS
Inhibitors	Scared of Internet fraud
Situation	Connection with NHS means that IT and related strategy are connected to the NHS Web site about them but out of their control advertises services provided, but doesn't sell products Web site is currently outsourced and modifications go through third party

Table 38 Formal strategy leader: STE

STE is a provider of *Shelter Time Employment* for people with mental health problems. It is a small company classified as a formal strategy leader and in the context of SMEs it is in the unusual situation as it does not have to make a profit from the products it is selling to the customers. Except the sales side, i.e. the products produced by the employees, STE also provides a therapeutic service for the employees, also referred to as clients, by giving them an opportunity to gain experience and confidence. For providing these services STE receives funding from the NHS additionally to the profit it makes from selling the products to customers.

STE is on the first stage of the e-adoption ladder. They are using e-mail, but only for communication with the NHS trust, not for communication with customers or suppliers. Even though STE does not have it's own web site for the sales side, it's services offered for the therapeutic side are advertised on the NHS trust's web site.

The service manager finished his MBA recently and is using the strategic models he got to know during his course to analyse and improve the services of STE. The connection with the NHS does however mean that a lot of the IT as well as the IT related strategies are controlled by the NHS trust and he has therefore only very limited influence on them.

SDS

Name	SDS
Information	Department store Medium sized enterprise Describe themselves as "mid-market value added retail"
Market	Local and regional
Drivers	Efficiency
Inhibitors	Lack of standardisation of procedures
Situation	Use of e-mail for external communication Computerised system will automatically create purchase orders, but they will have to be faxed or e-mailed as providers do not offer a more advanced way of buying online. SDS used an EDI based system previously but it is not used anymore. SDS does not sell online as it would be seen as a distraction of their main business and as it would require the appropriate warehousing and picking systems, which are not present.

Table 39 Formal strategy leader: SDS

SDS describes it self as a *Small Department Store.* It is classified as a medium sized enterprise and as a formal strategy leader. Rather than specific retailers SDS sees shopping centres and town centres in the North West of England as their main competitors.

SDS is on the first stage of e-adoption as it is only making use of e-mail. It does not have a web site. A web site would be used as a show case, but because SDS does not feel that a web site has a high enough priority for their business, it has not been included in the business plan, as SDS's very structured approach to business strategies because of its previous experience means that all parts of the business plan should be achieved and items that would be unachievable and would have to be transferred to the following year will therefore not be included. E-mails are used for external communication and they are also used to order from suppliers. The systems from SDS and its suppliers are however not integrated and e-mails are therefore just used to replace letters or a Fax machine, human intervention is still needed for the orders to be processed.

SDS sets an annual business plan near the beginning of the year and reviews this business plan quarterly. The business plan includes different aspects of the business, like its merchandise, human resources, business infrastructure, or supplier base. E-business is usually not an explicit part of the aspects included.

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Summary

E-business

Formal strategy leaders as defined in the quantitative stage use e-mail or they do not use any form of e-business technology. All companies interviewed in the qualitative stage of the study were on the first stage of the e-adoption ladder, using e-mail. There is a web site about STE, but STE does not have direct control over this web site because it is by the NHS to which STE has strong ties.

Strategy

Even though the formal strategy leaders are using business strategies, as their name suggests they do not use strategies for their e-business planning. In the case of STE it is because even though they control their own business strategy, their strong links to the NHS means that the NHS is controlling their IT related strategies. CAD does not have strategies for e-business because of time restraints and limited availability of staff.

6.3.4 E-adoption leaders

E-adoption leaders are SMEs who do not have an e-business strategy and do either have no business strategy and have high levels of e-adoption, i.e. they are engaged in at least e-commerce, or they a business strategy and have at least medium levels of e-adoption, namely they have a web site.

EDM

Name	EDM
Information	Engineering distributors and machine tool dealers (new and second hand) Micro sized enterprise
Market	Regional Main customers are two very big companies
Drivers	Better buying terms from suppliers (2% discount)
Inhibitors	Human error as e-business systems not integrated Non-acceptance from customers
Situation	Several forays into the e-business from a selling point of view, without any success Use of e-business from a purchasing point of view successful and used as an integral part of the purchasing system

Table 40 E-adoption leader: EDM

EDM is a micro sized *Engineering Distributor and Machine* tool dealer and an e-adoption leader. It is buying and selling new and second hand machinery and engineering equipment from and to customers in their county with competition from other local companies as well as from national companies who offer their goods through catalogues.

The owner of EDM has a background in electronics which led to a personal interest and skills in the area of e-business technologies and also to EDM trying to sell to their customers using e-business technologies. The owner was even responsible for setting up a regional e-commerce marketplace, but all these attempts of increasing their level of e-adoption for sales were unsuccessful, as described in more detail on page 238, so EDM decided to revert back to more traditional ways of selling. It does not have a web site at the moment. From a purchasing point of view e-business technologies were introduced because they enable EDM to get better buying terms and are now used successfully and

as an integral part of the purchasing system. When it comes to communication EDM is using e-mail mainly with its suppliers, but also with those customers willing to use e-mail communication. There are however many customers who do prefer fax transmissions or telephone calls.

EDM feels that it is in a position were it is "squeezed" by customers and suppliers and therefore cannot have a traditional business plan, but must be very flexible and adjust to the customers and suppliers. This dependency on other companies has been discussed in academic literature (Kalakota & Robinson 1999; Mehrtens, Cragg, & Mills 2001), but in the case of EDM it creates uncertainty that prevents it from creating a traditional strategy that is seen as too inflexible.

DBG

Name	DBG
Information	Distributor of business gifts and promotional items Micro sized enterprise
Market	Regional emphasis, but also national and international
Drivers	Personal interest for technology made them early adopter of e-commerce 24h ordering for customers
Inhibitors	Problems integrating legacy back end systems and e-commerce systems
Situation	Using the Internet doubled their turnover Their 'e-trading e-commerce' site is by far the most important source of new business Sell a range of leading, best selling products on their web site, but not everything

Table 41 E-adoption leader: DBG

DBG is a micro sized *Distributor of Business Gifts* and promotional items. It is classified as an e-adoption leader and tries to do business with other SMEs while most competitors try to target large companies to sell higher volumes. Even though DBG sells nationally and internationally there is a bias towards the North West of England.

DBG describes its web site as an "e-trading e-commerce" web site. The web site was not skill driven, as in some other companies, instead it has been developed by a company DBG got to know through the local business club and is now by far the most important source of new business. The best selling products can be ordered on its web site and customers can also send artwork or logos electronically if they need the business gifts customised. Before e-business was introduced turnover was less than half of the current turnover. DBG described the previous situation like this:

> "We spent a lot of time sort of stimulating business by doing mail shots and special offers, and we haven't got time to do that anymore. We don't need to do that anymore." (DBG)

Its online catalogue is however only an abbreviated version of the catalogues it normally offers, i.e. catalogues of other larger buying groups or other organisations overprinted with DBG's own details.

DBG's experience also leads to a situation where it is seen as an IT and e-commerce leader and many members of the local business club come to DBG for advice relating to IT and e-commerce.

For the owner of DBG running a SME is a lifestyle choice and he he does not want to establish a strategy at the moment, because his children are only a short time away from wanting to find employment. As long as he does not know whether they want to be part

of the company he does not want to change the company and therefore does not use strategies.

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PBM

Name	PBM
Information	Facilitator of play-by-mail games Micro sized enterprise Was *blind e-business user*, now *e-adoption leader*
Market	International, Very few competitors High
Drivers	Internet changed their industry and market and made move to Internet necessary, as customer wanted to receive results faster by e-mail.
Inhibitors	none
Situation	E-business adoption was very beneficial for the company, but was market driven, without a strategy behind it: "I don't know. I 'd probably have to be shown how to work out a strategy in the first place." In hindsight e-business should have been adopted "faster".

Table 42 E-adoption leader: PBM

PBM, originally seen as a micro sized SME in the group of blind e-business users is specialising in marketing and facilitating *Play-By-Mail* (PBM) games and has been reclassified as an e-adoption leader. PBM does not deal with any physical products as it is providing intangible goods in the form of virtual services. The market for play-by-mail games has changed dramatically with the Internet's rise of popularity because mail as the transport medium for play-by-mail games now has to compete with e-mail and the web.

The market is not very competitive as there are not many companies who offer play-by-mail games with PBM being the market leader, and as the products of different companies or even products of the same company do not necessarily compete with each other. Even though PBM already caters for an international market, it plans to release versions in different languages to expand their customer base even further.

PBM's communication and orders received by post have decreased dramatically in recent years which led to a situation where 85% of the customers communicate and order by e-mail. PBM also has a web site. Most of PBM's services are fully automated, meaning that the processing of the orders, the adding of value and the delivery of services are done electronically. The MD describes the process that was involved as natural progression, where customers wanted to get results faster than the traditional postal way. With PBM selling a virtual product this also meant saving labour, printing, maintenance and postage costs and PBM was able to halve the number of staff. The MD thinks that time and effort spent on developing a strategy could be spend "doing something else" (PBM). Another problem is that the MD does not know how to plan strategically. Even though no strategic planning in the traditional sense was involved the market drove the e-business adoption and led to these integrated systems over a period of five years, including online payments by customers and online advertising and search engine optimisation by PBM, which is quite successful in attracting new customers.

HHP

Name	HHP
Information	Caravan holiday home park Micro sized enterprise Was *old fashioned SME*, now *e-adoption leader*
Market	Regional
Drivers	Personal interest, "you have to have a presence on the Internet, and it's got to the point now where we feel if you haven't got a web site or at least an e-mail address, then basically, you're not really in business."
Inhibitors	none
Situation	Original web site designed by college students as a project. Moved on since then to using a professional web designer. Want to "revamp" web site every 18 months. Web site definitely brought new business

Table 43 E-adoption leader: HHP

The second micro-sized e-adoption leader is a service supplier to the holiday home industry, originally from the group of old fashioned SMEs, that is buying and selling caravan holiday homes and is also a *Holiday Home Park* (HHP).

HHP's customers are regional, from North West England and ninety percent of the customers are end users. There does not seem to be direct competition between different parks, as each park seems to cater for different types of customers and prospective customers are referred to other parks if they do not match the preferred clientele (e.g. customers with young children, pets or customers from a different age group or with a different income level).

During the quantitative stage of the research HHP had been classified as an old-fashioned SME as it answered that it did not do any form of e-business and did not have a formal strategy. The company is a family business and has been taken over from the older generation a few years earlier and the new owner did introduce several changes. New premises were built for the offices and the company now does have a formal strategy and also started using e-business technologies to a greater extent, including e-mail and a web site. Even though the business is a very personal business, meaning that people would not buy a caravan without looking at the park and its environment and the caravan itself first, HHP gets "a number of e-mails on a daily basis requesting information, brochures, facts and figures and so on" (HHP). HPP finds communicating over the Internet very advantageous and now also communicates with suppliers via e-mail, and also buys goods from its suppliers online. Their website includes stock levels so that customers can check availability of products, but currently the web site is not tied in with any of the company's other IT systems and information has to be updated manually.

Altogether the use of e-business technologies has been very successful and was worth the cost. HHP is "absolutely sure that [it has] got business from the web site, i.e. people have been to the park because of what they've seen on the screen" (HHP) and "the cost is negligible, it's.. it's nothing, for what it costs us to have a web site presence and the amount of business it brings us, it is nothing, it is nothing at all" (HHP).

Because of the slow moving nature of this industry without many changes HHP does not see a big need for e-business strategies. The company does instead look for opportunities that open themselves up and reacts to them if they look promising. This is similar to the (non e-business) strategy generally used by HHP that has been described

171

as "a daily thing [...] we just look at whatever we need to do" (HHP). The reason for this seems to be the fact that all the important decisions for the company are taken by one person, so formalising the strategic process could be seen as a hindrance that does delay getting things done: "this business is very much a one man band in the fact that I'm sort of controlling everything that's going on" (HHP). This does however result in the company not having any records of previous strategies and developments. This became obvious when the interviewee wanted to keep the questionnaire from the first stage that was brought to the interview, to have a record of recent changes in his company: "I will mark on it the changes that happened since. It's interesting to see how the changes have happened since eh since then." (HHP). E-Business strategy also seems to be perceived as something that should be technology-driven, therefore ideas about e-business strategy in HHP revolve around the introduction of new technologies to enhance the web site in such a way that it becomes a high-tech brochure where potential customers can see three-dimensional images of caravans and live video streams of caravans.

There are also no plans to progress further on the e-adoption ladder and to develop e-commerce, even though the company would like to use new technologies when they are available for their web site to improve the current attractiveness of the web site as a brochure. The reason for not trying to develop e-commerce further is the unsuitability of the product, i.e. caravans and the park to be sold over the Internet. For some mass-produced products customers have a chance to get to know a product and can therefore buy it over the Internet with confidence that they get what they want. For cheap products customers might be willing to risk buying a product as they will not lose a lot of money, but for HHP's products and services, i.e. caravans and the park, customers would not buy online.

CNC

Name	CNC
Information	Computer networks company (dealing with cabling and network configuration) Small enterprise
Market	Customers are national and international, There are hundreds of competitors
Drivers	Required by business partners
Inhibitors	Reliability and security
Situation	No web site, as CNC states it would not help to acquire the large value contracts they deal with, but electronic invoicing, ordering and banking CNC was forced by some big customers to use their systems

Table 44 E-adoption leader: CNC

CNC is a *Computer Networks Company* classified as a small enterprise and as an e-adoption leader. Their main business is installing cables, switches, routers and to configure networks at banks and insurance companies nationally and internationally.

They do not have a web site but use online banking, send invoices online and get orders from some of the customers through the Internet. They also supply online support for their customers by remotely connecting to their customers' routers. The introduction of e-business technologies was required by some of the customers and business partners and was therefore introduced. Increasing the level of e-adoption, e.g. through selling on the Internet is seen as a waste:

> "It's just a waste of resources to put to, because you have to keep updating your site, and you're not really gaining a great deal. [...] Well, we've no choice, we've got to keep using the systems that we're using, but the Internet is not

gonna replace a salesman, is it? So, I can't see the point of putting a website out there and hoping for people [to buy from it]. To my mind [this] won't happen." (CNC)

Even though CNC has a strategy for its business it did not have an e-business strategy when it introduced e-business technologies and it cannot see any benefits in working out a strategy for the future of e-business.

MCR

Name	MCR
Information	Manufacturer of closing rings, predominantly for the packaging industry in the UK Small enterprise
Market	The market in the UK is declining, while the global market is stable. MCR is therefore expanding into other countries.
Drivers	MCR saw e-business as a necessity as they did not want to be left behind
Inhibitors	Waste of time when dealing with spam and viruses
Situation	MCR is using e-mail for communication. They rarely buy online. There is a web site, but they do not sell online because the products in their industry are not standardised so their products are not off the shelf and are made to order

Table 45 E-adoption leader: MCR

MCR, a *Manufacturer of Closing Rings* is a small company manufacturing closing rings to hold the lid on steel drums for the packaging industry. The UK market for closing rings is very mature and declining while the global market is stable or only slightly in decline. MCR is therefore trying to expand to other countries to open up new markets for itself.

174

MCR is classified as an e-adoption leader, but within the group of e-adoption leaders there use of e-business technologies is low, as they do not sell online and use e-business technologies to a lesser extend for communication and marketing than some other e-adoption leaders. E-mail is used for communication and MCR is sometime purchasing goods through the Internet. There is a web site, but because the products of MCR are not off-the-shelf but very specialised and require detailed technical specifications from the customer they are not offered through the web site. The web site generated a few additional customers, but the impact of the web site is perceived as very limited.

Even though MCR has a verbally defined strategy for their business, they do not make plans for the use of e-business technologies in their company as further e-adoption is seen as providing only "limited payback".

GLF

Name	GLF
Information	Golf and leisure facilities Small enterprise Was *old fashioned SME*, now *e-adoption leader*
Market	Very competitive Local/regional; 15 mile radius
Drivers	E-Business driven by requests from members, by member officers who were exposed to it in their jobs and by the advisor of the management committee (interviewee)
Inhibitors	Price of hardware / software / implementation
Situation	Communication with members had stopped but will start again Simple website with basic information

Table 46 E-adoption leader: GLF

175

The last small sized SME from the e-adoption leader group was previously classified as an old fashioned SME. It provides *Golfing and Leisure Facilities* (GLF) for their members and visitors. They compete in a very competitive market with ten other golf clubs in close proximity for individuals, golfing societies and small corporate bodies as customers. Even though main competitors are proprietary golf clubs that provide facilities to the general public other leisure activities and sports like Rugby or Football can also be seen as the extended competition.

GLF previously used e-mail to communicate with their members, but because of the problems they had with the software used they stopped completely and are just about to begin electronic communication again after new software had been introduced. This also led to the introduction of a very simple web site providing basic information about GLF. Except for technical issues, electronic communication is seen very positively as a quicker, more direct way to communicate that is even accepted by the older members of GLF, and as new means of getting approached by the public, that is also saving money, time and labour. The introduction of a web site and their use of business strategies led to a change from GLF being an old fashioned SME to it being an e-adoption leader.

Procurement is still done the traditional way, with no use of online procurement as it is not perceived to be beneficial for GLF. Procurement is mainly done through membership of a purchasing group on one hand and through local suppliers on the other hand for a "a very quick, speedy service" (GLF) even though it is more expensive, so GLF currently does not see any need to actively switch the mode of procurement.

Products and services are also not offered and sold online unlike those of some of the bigger competitors as the current approach is seen as being more personal.

The introduction of e-business technologies happened naturally without explicit planning. There were however problems when GLF initially tried to save money when e-business technologies were introduced, resulting in the original hardware and software not being suitable to cope with the requirements of a commercial business, and had to be replaced.

GLF is currently experiencing a change in the market that will make more planning and strategic thinking necessary. Whereas previously there has always been a waiting list for new members changes in the market led to changes in the whole industry. GLF also expects that changes in the use of e-business technologies will trigger a change in their strategy for business and e-business.

IDG

Name	IDG
Information	Importer and distributor of giftware, only B2B Medium sized enterprise
Market	National and international Very competitive
Drivers	e-business technologies a new way of marketing to help customers find IDG
Inhibitors	Fear of competitors gaining information too easily that can be used to copy products
Situation	Use of e-mail for communication IDG does not sell online, as their customers need to see the products in reality

	IDG also does not buy online, unless for unusual reasons (e.g. SARS) it is not possible to visit suppliers. Exception: C class inventory, i.e. low cost items, consumables like office supplies

Table 47 E-adoption leader: IDG

IDG is classified as an e-adoption leader and is a medium sized enterprise *Importing and Distributing Giftware*. The main customers are small shops as well as big national retailers. IDG describes its industry as very competitive with several hundred gift companies in England trying to sell to the big national retailers.

IDG is using e-business technologies to support their business. This takes the form of presenting their products on its web site, but because customers buy products in large quantities they

> "are still into actually picking the things up and feeling it and touching it rather than to see a picture." (IDG)

For the same reason IDG would access information online about products it wants to buy, but will then visit the manufacturers who are usually located in the Far East the examine the products before placing orders. Only when this is not possible, which was the case when the company did not want employees to travel there because of SARS, are items bought directly. This situation, where the manufacturers are visited before placing an order, and the fact that the business transactions take place with companies in other countries is not supportive of further e-business integration and led to the current situation where only low cost items and consumables are bought online. E-mail is used for external communication and has replaced the phone for communication with suppliers and the big customers. As e-business is not set up for selling online, enquiries from customers about orders have to be dealt with manually using e-mail. IDG is only presenting a small number of products online, like DBG, because they introduce about

800 new products every six month, which would result in a lot of work to keep the web site updated.

> "unless we employed somebody to just work on it all the time as in taking photographs, uploading new photographs, checking the stock, [...] taking products off that have sold and unless we actually employed somebody to do it [and] paid them [...] 16 to 18 grand a year [...] for them doing that job, the web site would have to be bringing in £ 250,000 worth of business, so until we can see that happening we can't want somebody being employed to just run the website. Until we see one of our competitors successfully running an e-shop, then we would probably think about it, but until we actually see it happen we use our web site as a marketing tool. " (IDG)

Strategies are discussed every year and there are also bimonthly management meetings where any issues would be discussed, which could include the use of the Internet if necessary.

GBC

Name	GBC
Information	General building contractors Medium sized enterprise
Market	Regional Very competitive Public and private sector, commercial and industrial markets
Drivers	Exploring new technologies
Inhibitors	Time and work intense
Situation	E-business technologies mainly used for communication and only some purchasing Web site used as brochure

Table 48 E-adoption leader: GBC

GBC is a medium sized enterprise and describes itself as a *General Building Contractors* operating in a very competitive market. Customers are the general public, companies, and local authorities in the region.

Its main use of e-business technologies is for internal communication and for external communication with clients and suppliers. GBC is also purchasing some products using e-business technologies, but most items bought from suppliers are bought

> "the standard way [by] transferring documents [...]because they don't have the setup rather than ourselves" (GBC).

It also has its own web site which is mainly seen as a marketing tool.

Even though GBC is a medium sized enterprise it does not have a formal business plan and e-adoption was driven by the wish to explore new technologies which made them adopt e-business technologies before many of their competitors did.

PSF

Name	PSF
Information	Producer of synthetic fibres, buyer and seller of conductive fibres and special polymers Medium sized enterprise Was *old fashioned SME*, now *e-adoption leader*
Market	Europe and Asia Number two in their market
Drivers	Originally saw e-business technologies as a novelty, but use of e-mail developed extremely fast
Inhibitors	"We're in a business where each order we have is special. So we're tailoring the product to the customers order. It's not like we have a lot of stock, and we're just selling that stuff. We're making and tailoring to the customers needs. So it's difficult to imagine somebody coming

	on our website and say OK, I want a thousand kilos of that, it's not gonna be in stock. We're making things to order, we're not producing to a stock an then people taking that stock out."
Situation	Orders now coming in by e-mail, replacing fax as the common way of ordering. Business sells to few customers (~200) in the industry with a small number of high volume orders, so driving e-business engagement forward is not seen as worth the resources it would need. Business planned every year and revised every month, but e-business and even IT not included. The e-business adoption has been taken to a level that is very beneficial for the company, but further e-business adoption does not seem appropriate for the MD.

Table 49 E-adoption leader: PSF

PSF, originally classified as an old-fashioned SMEs has two different areas in their business. It is *Producing Synthetic Fibres* (PSF), but it is also buying and selling conductive fibres and special polymers. PSF's markets are Europe and Asia and their main competitor is a Japanese owned German company that is the market leader in Europe, while PSF is currently number two.

Orders are now increasingly received by e-mail. PSF saw a dramatic change over four years from a situation where e-mail wasn't used at all to a situation where e-mail is a necessity and is "something you just had to have" (PSF). This shift in communication medium means that the pace of the business increased dramatically. The MD states "I come in in the morning at eight o'clock and I answer my e-mails from Asia, so that they have an answer the same day and before people would expect an answer within two or three days, by fax, now people expect an answer the same day" (PSF). Especially when dealing with Asia the use of e-mail has been perceived as being extremely beneficial for

PSF, as it helps to overcome language and time barriers, speeds up communication, provides a record and even enables communication outside the business premises.

PSF does have a web site which the MD describes as "poor". One of their competitors has a well integrated e-business system that had been established by the competitor's previous multi billion pound parent company, but the MD does not think that a similar system for PSF would be worth the cost: "It's difficult for us to set that up and have the resources to do that or spend the money to do that. It would be very nice to have that, but it's very nice to have rather than we must have it, I think, at the moment" (PSF). PSF does not sell to the public, instead their goods are sold to a small number of industry customers. Over a year there are not so many orders so selling online does not seem to provide benefits at the moment as "each order is a special event and is usually sent in by e-mail as an attachment, or by fax occasionally." (PSF). For PSF this also means that selling also relies on relationships with the customers and e-business might be too impersonal. When it comes to procurement, products are researched online but are then still ordered using traditional means, mainly by phone, even though some of the companies PSF regularly buys from do sell online. Despite researching products from suppliers it has also become increasingly common to research competitors and other information online. PSF does not try to expand e-business at all and also does not do any e-business planning, as it feels that it doesn't have the resources to spend on this area that is being perceived as being "not the most important thing" (PSF).

PSF does however plan the non e-business aspects of the company every year and is revising them every month as part of their ISO 9001 certification.

HCS

Name	HCS
Information	Home care services for elderly and disabled and, specialising in specific client groups, i.e. mental health and rehabilitation, called extra care sheltered housing Medium sized enterprise Was *blind e-business user*, now *e-adoption leader*
Market	Local biggest purchaser is the local authority, but also some private clients advertising not appropriate, so business through word of mouth or through provider list, a list compiled by the local authority with agencies who qualify to be on the list
Drivers	One of the partners is IT champion who also leads another IT focussed company with close ties to HCS
Inhibitors	Process of e-adoption very time consuming
Situation	As advertising for HCS's service is not appropriate the e-adoption is currently only at the web site level. E-mail is used for internal and external communication, there is a web site.

Table 50 E-adoption leader: HCS

Home Care Services (HCS) is a medium sized company caring for the elderly and disabled and specialising in specific client groups, particularly clients with mental health problems and on rehabilitation. Because the interviews showed that HCS is using business strategies and e-business strategies it is an e-adoption leader. Originally it was classified as blind e-business user, when the questionnaire showed that it did not use business or e-business strategies.

HCS's biggest purchaser is the local authority and its competitors are other local care agencies. Computers and the use of e-business technologies were introduced because of existing skills and interest from one of the partners/directors in computers. The introduction of the web site was further pushed forward because of pressure from

organisations HCS is working with, but this web site is still very basic. E-mails are used to communicate with the purchasers, the local authorities, social workers and employees, in some cases also with service users.

HCS has strategies for e-business, but they are kept separate form the normal business strategy and they seem to be discussed and decisions seem to be made very informally at staff meetings. The e-business strategies are also not fixed, i.e. they are not written down but are described as "ongoing".

Summary

<u>E-business</u>

The micro sized e-adoption leaders seem to have benefited most from the introduction of e-business technologies: DBG doubled their turnover, while PBM cut costs and attracted customers and also HHP got new business through the web. Nevertheless some e-adoption leaders did not see their e-adoption as very successful, e.g. EDM and CNC. As the biggest group with companies covering many different industries it is difficult to summarise the e-business situation of the e-adoption leaders, but it is clear that the use of e-business technologies is generally seen positively by the companies.

<u>Strategy</u>

As a group covering companies that use formal business strategies and companies that do not use formal business strategies the attitudes of e-adoption leaders can be very

different. It is however clear that for many e-adoption leaders the introduction of e-business was technology driven. This sometimes included also the companies' markets as the driving force and results in companies reacting to opportunities created by technologies or the market without careful planning.

6.3.5 E-business strategy leaders

E-business strategy leaders are classified as all enterprises which have an e-business strategy. The group of e-business strategy leaders was the smallest group found in the data analysis stage, as only very few enterprises did have an e-business strategy.

MDA

Name	MDA
Information	Manufacturer of dental appliances for the dental profession Micro sized enterprise Was a *formal strategy leader*, now *e-adoption leader*
Market	Mainly regional Work done nearly exclusively for dentists
Drivers	Did not want to be left behind technology wise
Inhibitors	Possible waste of time when dealing with spam e-mails
Situation	e-mail is used to communicate with customers and suppliers There is a simple brochure type web site

Table 51 E-business strategy leader: MDA

MDA is a micro sized enterprise specialising in the *Manufacturing of Dental Appliances*, only supplying their products to professional dentists.

Originally classified as a formal strategy leader, MDA increased their level of e-adoption and also increased their planning for e-business which makes this company now an e-adoption leader.

MDA has a simple web site used as a brochure to provide information about the company, but their main use of e-business technologies is very simply: MDA is using e-mail to communicate with suppliers and customers. At the moment physical models have to be sent to be able to create crowns for the customers, but new innovations might make it possible in the future to replace the exchange of physical models with sending digital scans of dentist impressions, a process that has already begun. Currently only the first process of making certain crowns involves sending scanned images to another company in Sweden, before MDA finishes off the products they receive back, but MDA is expecting to rely more and more on these technologies in the future.

MDA conducts a management review once a year looking at all aspects of their responsibility and their e-business plans would be reviewed as a part of this management review when their general company strategy is addressed as well.

EMC

Name	EMC
Information	Electronics manufacturing company, specialising in the design of non-contact safety switches
	Small enterprise
Market	National, now also international
	Customers are engineering companies
Drivers	Researching information
	Trying to provide easy access to information for customers
Inhibitors	Fear of viruses
Situation	E-business technologies primarily used for research purposes
	Other uses include communication using e-mail and providing information through their web site

Table 52 E-business strategy leader: EMC

EMC is a small enterprise describing itself as an *Electronics Manufacturing Company*, specialising in the design and manufacturing of non-contact safety switches. Until recently customers have been engineering companies in the UK, but three years ago EMC started to target the international market and now has distributors in several other countries. This also led to an increase in international customers because EMC can now support them worldwide.

According to EMC their primary use of the Internet is for research on components as well as competitors. They also provide their brochure and technical information on their web site for customers and use e-mail.

As an e-business strategy leader EMC is using business strategies as well as e-business strategies. Their strategies are usually revised twice a year before they hold meetings related to their ISO 9001 certification and according to EMC they include:

> "Internet, e-commerce, as well as sales strategies, production strategies, things like that" (EMC)

187

In the future EMC intends to deepen its use of strategies because of the benefits the use of strategies for e-business has brought:

> "I'm sure with a bit more coordination we could achieve a lot more. You know, we've achieved what we set out to achieve, and that I think is working reasonably well, but with a bit more coordination, a bit more planning, I think there is more to come out of e-commerce, definitely." (EMC)

MFH

Name	MFH
Information	Helicopter maintenance, flying school, helicopter trading
	Medium sized enterprise
Market	Regional
	Virtually no competition as flying to competition is too expensive
Drivers	IT champion present
	Easy to source unusual items
Inhibitors	Technical problems
Situation	Early adaptor in this industry
	Web site as brochure, heavy use of e-business technologies for communication and records, but systems between business partners are not linked and electronic signature are not human readable, so traditional signature still used to prove / sign that work on aircraft components has been done

Table 53 E-business strategy leader: MFH

MFH is a small enterprise with a *Maintenance* business that repairs, modifies and maintains helicopters, a *Flying* school for *Helicopters* and it also buys, restores and sells helicopters.

For certain types of helicopters MFH is the only approved helicopter maintenance organisation between Birmingham and the Scottish Highlands and because flying a helicopter to the South of England might cost between several hundred and several thousand pounds depending on the type of helicopter there is no real competition in the maintenance side of the business.

MFH is relying heavily on electronic communication and makes extensive use of computers, networks and to some extent also e-business technology. Their biggest inhibitor to increased e-adoption is that the aviation industry is slow to adapt to new technologies and is heavily regulated. MFH still has to rely on a fax machine to transmit signatures in order to convince

> "another entity that [they] have done a particular piece of work on an aircraft or a particular piece of work on a component [because] there's still a little bit of distrust with electronic signatures in the aviation industry" (MFH).

MFH cannot buy aviation parts using e-commerce because safety considerations mean that the parts have to be traceable to the manufacturer, but the manufacturers do not use e-commerce. Non-aviation supplies are however bought online. MFH does offer e-commerce services to its customers, but established web sites for the different areas of its business as "information portals" that can also be used to contact MFH and to request information.

For their normal business strategy MFH follows the aviation standard JAR 145 which it compares to ISO 9001. It has a five year plan, a one year plan and a six months plan. MFH does however put less emphasis on the long term plan:

> "The five year plan is probably now a waste of time, any business that runs a five year plan I think is wasting the time, because business changes so quickly that the plan is out of date by the time it's even been written, so my opinion is that a five year plan is really only for the big multinationals. For SMEs what's

189

more important is a one year plan and a six monthly plan and with the ability to change at a moment's notice, because circumstances do change and there are surprises and sometimes opportunities come from unexpected areas. There's a lot of business that doesn't happen that was expected and there's a lot of new business that happens that wasn't expected. Therefore to have a long term plan is of little use. (MFH)

MFH's attitude to their e-business strategy is similar. It is felt that there is a need to keep track of the environment constantly and to update the strategy to the new environment accordingly. The interviewee explained:

"You may get something which prompts you to require to change now, and it would be a mistake to have fixed periods or twice a year or annual policy decision, you've got to move quicker than that and you've got to keep your eye on the ball and if the ball changes then you need to respond to it immediately." (MFH)

Changes in the industry or in regulations, together with a lack of standardised electronic systems and procedure mean that MFH has to adjust strategies and systems to the environment as shown in an example:

"America decided that they were going to [transmit] urgent airworthiness bulletins using e-mail, and we had to respond to that and make sure that we had internal processes in the business to look at e-mail every single day and to particularly look at these airworthiness bulletins and check the airworthiness bulletins to see if any of the bulletins were applicable to the aircraft types that we maintain. So we had to actually put a process, an internal process into the company to look and log those airworthiness bulletins." (MFH)

SLS

Name	SLS
Information	Solicitors providing legal services, general practitioners
	Small enterprise
Market	Local
	Partners specialise in different areas of the market
Drivers	Keeping up-to-date, ahead of competition
	IT champion present
Inhibitors	Initial cost
Situation	E-mail for communication
	Recently took ownership of their brochure web site to keep it up-to-date
	Online procurement of supplies and knowledge based resources

Table 54 E-business strategy leader: SLS

SLS is a small enterprise and a firm of *Solicitors providing Legal Services*. It has three offices in different towns in the area. SLS describes itself as general practitioners and the market for general practitioners is quite competitive, but they also have solicitors specialising in different areas of the law which has been a "good marketing edge" for them in the past.

SLS used an external consultant who is an expert on e-business for solicitors to help them with the introduction of e-business technologies. The company makes use of e-mail and has recently taken over control of their web site to be able to amend and update the site itself. They also use the Internet to subscribe to and access various knowledge based resources like court reports.

Their e-business strategy is "part and parcel" of their business plan which is revised twice a year, in March and in September. Additionally there are monthly "formal

partner meetings" where issues arising on the business plan will be discussed. This is seen as necessary to push things forward constantly, especially items relating to IT, but the plans would also be embedded in short term twelve months goals and in longer term goals over three years. SLS is fairly flexible but had the experience that sometimes IT or e-business related decisions were made one or two months previously but sudden changes in the market or in technology meant that they were not flexible enough.

HOT

Name	HOT
Information	Hotel and spa, offering conference facilities Medium sized enterprise (altogether eight hotels)
Market	Competition different for different sectors of the business Regional for leisure market National and international for conferences
Drivers	Increase number of bookings
Inhibitors	Lack of expert knowledge
Situation	Took on an e-commerce manager recently to push e-adoption forward and get ahead of competition Currently 10 % of business from the web, expected to increase Want to integrate e-business system and back-end

Table 55 E-business strategy leader: HOT

HOT is a group of eight *Hotels* classified as a medium sized enterprise. 35% of its business is from the conference side, which attracts national and international customers, while the leisure side of the business, which includes its spa / health and beauty side, attracts mainly regional customers.

HOT thinks it is generally ahead of its competitors and it currently gets 10% of its business through the web site. It expects this number to grow in the future, but because the web site is currently not integrated with their computer systems bookings through the web site are using a different database than normal bookings. This lack of integration and the need for a person responsible for the e-business systems led to the recent appointment of an e-commerce manager whose task it is to push e-adoption forward and to help HOT to get further ahead of the competition. HOT sees itself as very proactive and is constantly looking at how their use of e-business technologies could be improved.

CAA

Name	CAA
Information	Chartered accountants and business advisors
	Medium sized enterprise
Market	Regional
	Not very competitive
Drivers	Keep up-to-date
	Increased efficiency
Inhibitors	Cost
Situation	E-mail used for internal and external communication
	Web site as brochure, attracted some new customers

Table 56 E-business strategy leader: CAA

CAA is a medium sized enterprise. As *Chartered Accountants and business Advisors* its customers are other SMEs, sole traders and private individuals. Its customers are mainly regional and CAA describes the market as not very competitive.

The company makes use of e-mail for communication with clients and it has a web site that it sees as a marketing presence. Sometimes customers from abroad would find the web site on the Internet and ask for tax advice on British legislation by e-mail, but this does not happen often and business generated from e-mail customers is not seen as important for the company.

CAA has a formal way of dealing with their business strategy, which includes a five year plan and a one year plan. There are also regular meetings that will include discussions about its e-business strategy. The IT team together with the managing director are responsible for the e-business strategy. CAA states however that the focus is on

> "improving our systems internally, rather than trying to sell externally using the systems." (CAA)

Compared to other e-business strategy leaders CAA's e-business plans span longer periods of time, from a few months to one year.

PDC

Name	PDC
Information	Painting and decorating contractor Medium sized enterprise Was *formal strategy leader*, now *e-business strategy leader*
Market	regional
Drivers	Enterprise was "computerised" since the late 1970s, so the need for e-business technologies was recognised as it evolved
Inhibitors	Contractual obligations create a need for hard copies. The paperless nature of e-business technologies means that hard copies have to be created especially
Situation	Electronic communication with many clients, including tender information. Major client also introduced online tendering. Online credit checks on potential customers are also important, as is online procurement. PDC has a new web site used to get information to potential customers, but not prices.

Table 57 E-business strategy leader: PDC

PDC is a commercial *Painting and Decorating Contractor*. It is a medium sized enterprise and the largest company of its kind in their county. Their main competition consists of four national companies who have offices in the same area.

Previously a formal strategy leader their situation changed with the customer-driven introduction of e-business technologies and PDC is now communicating with its clients by e-mail, receiving instructions, specifications and tender information this way. The main use of the web is for doing credit checks on customers, buying products and PDC has also seen the recent introduction of online tendering from one of its major clients. Additionally PDC has a simple web site used to provide general information about the

company. Their new level of e-adoption and their use of e-business strategies means that PDC is not a formal strategy leader anymore but an e-business strategy leader.

PDC is using strategies and described their use of strategies as part of the process to obtain the Investors in People standard. Some issues related to e-business technologies, e.g. the need for upgrading the web site would also be discussed together with their normal business objectives, which are reviewed every six months.

Summary

The group of e-business strategy leaders can include SMEs with very different levels of e-adoption, but the companies interviewed were mainly on the web site stage with some companies leaning towards e-commerce.

Some of the companies' use of formal e-business strategies seems to be rooted in their respective industries: SLS, CAA and MFH come from industries with an emphasis on formal planning and EMC and MFH also relate their e-business strategies to their ISO 9001 and JAR 145 certification. As in other groups there is also the necessity amongst companies to keep track of their environment constantly to be able to adopt their e-business strategy. In the case of the e-business strategy leaders this constant updating is even compatible with their formal e-business strategy.

6.4 Drivers and inhibitors

Business research, like research in general often works with models. As models are often simplified representations of the reality that concentrate on important parts in the context of the model, it is easy to lose detail or to oversimplify the model. Levy and Powell mention a "propensity of past research to consider SMEs as a homogeneous group" (Levy & Powell 2005, p. 321) in the context of e-business and SMEs and the need for heterogeneity in SME research. While the first stage of this research used the identification of clusters as a means to bring the research forward and as a starting point for the qualitative stage, the interviews showed that the attitudes towards e-business and strategy are still very diverse within the individual clusters, and size and industry sector cannot help to explain the e-business behaviour further. Other means of grouping SMEs depending on their attributes are needed in order to help with the analysis. This section of the analysis will therefore look at drivers and inhibitors of e-business in the interviewed SMEs to examine whether there are themes common to certain types of companies. The drivers will be listed and discussed according to their importance. The interviewees did not emphasise the inhibitors as much as the drivers. The inhibitors will therefore be presented in a summary at the end and will not be discussed individually.

Necessity

The most common driver for entering e-business mentioned during the interviews was necessity. There are in fact two different aspects of necessity that were mentioned by the companies, but as they are very similar and difficult to separate they have therefore

197

been combined to one single driver. One aspect of necessity is competition, which results in the Internet being seen as important in this context because other companies use it. Another aspect is the use of the Internet by others, such as peers or customers and also competitors which results in e-business being perceived as an important trend that should be followed. This second aspect is related to the separate driver "Customers" mentioned later. This driver with both aspects led the companies to use the Internet, and as they are using it for business purposes this is seen as a first step of e-business on the e-adoption ladder.

Even though competitive pressure, a driver similar to the 'selective competitive environment' driver discovered in a recent study by Arbore and Ordanini (2008, p. 500), was not often explicitly mentioned in this context the replies of the companies indicate that e-business is just seen as a basic requirement in today's business environment. RFP said

> "I just think you ought to have it" (RFP),

while RRA answered

> "It was just the way forward, it was just the way I thought business was gonna go. We needed a presence on the web. Because we like to keep up with trends and technology." (RRA).

Many interviewees also indicated that they would feel left behind if they did not offer at least some form of e-business. When asked about the main influence that made them use e-business MCR said in this context

> "we weren't gonna be left behind." (MCR)

and HOT replied

> "It's the future. I mean it's as simple as that, I mean if you look at our competitors, the competitors do use it to different levels" (HOT).

This competition aspect of the necessity driver can also be found in other academic research. Al-Qirim found that competition can be a predictor of e-commerce adoption,

specifically the adoption of extranets or VPNs (Al-Qirim 2007, p. 468), and the most significant variable in Premkumar's study of IT implenetation in small business was competitive advantage (Premkumar 2003, p. 114).

Even though some companies explained why e-business is a necessity, most companies found it to be so normal to be engaged in some form of e-business and take it for granted that they did not illustrate this point further. Answers from several SMEs illustrate this. MIE replied

> "I think it was just the feeling that it was a tool for the future and we'd gotta be part of that, so we're gonna use the web band wagon, you know, that would lead you to a part of that" (MIE).

This answer is not too different to the one given by MDA

> "We just swept along with the tide. Everyone was going on to Internet, we just.. we have the mind that we do not want to be left behind, technology wise, so we have to.. we felt we have to keep with the times really." (MDA)

Necessity was the only driver mentioned by companies from all size classifications (micro, small and medium) and by companies from all five clusters, indicating that engaging in e-business is seen to be normal for all kinds of SMEs independent of their size, strategic planning and level of e-adoption. A micro-sized enterprise, HHP now classed as an "e-adoption leader" stated in the interview

> "You know, you have to have a presence on the Internet, and it's got to the point now where we feel if you haven't got a web site or at least an e-mail address, then basically, you're not really in business." (HHP).

SLS, a slightly bigger company, classed as a small enterprise that is an e-business strategy leader answered the following when asked for the main reasons for using e-business

> "keeping abreast with change, trying to be one step ahead of our competitors in terms of using the technology" (SLS).

SUC, a medium sized blind e-business user is also feeling that necessity is a big driver for e-business

> "I just think we decided that it was going to be such a major change and the people suddenly from being something that nobody really knew anything about all of a sudden everybody was looking on the Internet, so we decided that we needed to get a web site sorted out or we're going to be left behind really." (SUC)

while CAA, another medium sized enterprise, but classed as an e-business strategy leader, also mentions that it is necessary because others use it as well

> "I presume the major influence was everyone else has got it so we better have one. You know, so.. 'cause that's the way the train's going and you got to have one, so people'll ask you if you've got a web site and Derek obviously wants to say Yes, we have and there it is." (CAA)

RFC, a medium sized farmer cooperative classed as a blind e-business user, realised the necessity for e-business, specifically the provision of a web site when visiting a farm, one of their customers

> "My nephew was going to do a year's sabbatical [...] and the particular [company] that he'd chosen to go to he was trying to find some information out, and [...] he asked me what I knew about this company, and I said well 'I find as much as I can out and just let you know', he said 'Well, they can't be much of a company 'cause they haven't got a web site', so within a fortnight we had a web site, because that guy is only two years from running that farm and if that's his thought process, and you know, it's obviously one that's been brought in with him as far as finding information out, communication, yeah?, [...] and that's

what tempted me to do something, at least get a web site. It's not a very productive web site, but it is a web site." (RFC)

RFC realised that an online presence is important for the public image of today's companies as the new generation of customers grow up using the Internet and e-business technologies as normal tools, used on a daily basis and where many large companies like Google, Amazon and E-Bay are only known through the Internet, while traditional retailers and supermarkets like Tesco or Boots started to sell their products, even groceries online. Using e-business technologies is seen as a necessity by many SMEs, even though different SMEs use it for different purposes, often starting with communication, research or marketing and then moving towards e-commerce, selling products and integrating business processes using these technologies if this is seen as advantageous.

Technology

Another common driver for the use of the Internet and e-business stated by the participants was technology. This took either the form of an interest by decision makers of a company in technology or the form of e-business and Internet technology adoption for technology's sake. This driver was observed especially among e-business strategy leaders, but also among e-adoption, but not among blind e-business users and formal strategy leaders. There was one company now classified as an old fashioned SME where this driver was observed in the past when they still had a technical champion. When looking at the size of the company it is also interesting to see that this driver was overrepresented among micro sized companies. One possible explanation could be that micro sized companies are more often dominated by the founder whose personal interests will also have a bigger influence on how the company is led. On the other hand fewer employees could result in a situation where a single employee can have a big influence on the company or where an employee with specific skills can bring these skills into the company as in the case of WDC, described later.

This driver can be linked to the concept of the Information Technology Champions who "actively and vigorously promote their personal vision for using information technology, pushing the project over or around approval and implementation hurdles. They often risk their reputations in order to ensure the innovation's success." (Beath 1991, p. 355). The lack of this driver in the groups with the lowest level of e-adoption, blind e-business users and formal strategy leaders, and the strong presence in group with high levels of e-adoption support Teo's and Ranganathan's findings that these champions facilitate the adoption of e-business technologies, in Teo's and Ranganathan's case the adoption of business-to-business electronic commerce. (Teo &

202

Ranganathan 2004, p. 92). Bruque and Moyanob show that these champions can occupy different positions with the company (Bruque & Moyanob 2007, p.244). The fact that this driver was more frequently and more strongly observed in e-business strategy leaders than in e-adoption leaders suggest that the technical champions not only drive e-adoption forward, but also e-business strategy. A possible explanation for this result is that e-business strategies help the champions when promoting or implementing their personal vision for the use of e-business technologies.

MFH, an e-business strategy leader whose main business is not Internet related, but is repairing and maintaining helicopters, gave the following reasons for starting to use the Internet and e-business

> "because I'm in the electronics industry I've grown up with the Internet and I remember when it was ARPANET and I was in fact.. the server that we have here was one of the very first servers. They're very common now, but I was offering an Internet service many many years ago, so I was already Internet... I was already very knowledgeable about the Internet. And I'd been using the Internet long before it became popular." (MFH).

HCS, another company, again not working in a technology related area, but providing home care services for elderly and disabled, is lead by two directors, one of them has an interest in technology not related to HCS's business

> "He leads the other company, so obviously we have a interest in computers, full-stop, and programming. And he's always been quite innovative in that, so, you know that side of the business has always kept up to date really what's going on. " (HCS).

In the case of SLS technology also played a part, as well as competition which has been previously mentioned as a driver together with necessity. The interest in technology of

one of the partners was the driving force in this case, supporting the company's desire to stay ahead of competition

> "Keeping abreast with change… trying to be one step ahead of our competitors in terms of using the technology, we've got one partner now who is particularly interested in the latest IT and technology, so he often drives forward new initiative." (SLS).

A similar desire to stay up to date was seen by RRA, originally an e-business strategy leader, but now a blind e-business user

> "It was just the way forward, it was just the way I thought business was gonna go. We needed a presence on the web. Because we like to keep up with trends and technology." (RRA).

For DBG, GBC and HHP, all e-adoption leaders', interest in technology was also the driver behind the introduction of e-business and the Internet, even though these companies do not work in technology-related industries. DBG explained

> "I've always been aware of computer technologies, IT technologies from the very first time I went self-employed, first thing I did was buy a BBC micro computer, back in the early 1980's and start to generate my own databases and then as soon as eh applications came along that let you do graphics I started to do my own in-house printing with computers and so when the web came along, the very early days I got a website and e-mail addresses and in terms of e-commerce I think we were probably one of the first SMEs to have e-commerce. There are a lot of big organisations that started with e-commerce but we had an e-commerce site for three years now, that's quite special for SMEs [in this industry], not many have had it that long, [another company] got one there but not many have had them as long as we have." (DBG).

In a similar way GBC is also an early adopter of IT and e-business technologies in their sector

204

"I think it's something as far as technology 's concerned companies always had an ethos to explore new technology and things that they can.. we can see that applies to ourselves really, we've had computer within the business for over twenty years now (...) we've had e-business: facility to e-mail and a website for probably about six or seven years " (GBC).

The situation is similar for HHP, a company originally classified as an "old fashioned SME", but when its attitude towards strategies and e-adoption were reviewed at the beginning of the interview it was reclassified as an e-adoption leader. The interview that followed also confirmed this reclassification. The owner/manager replied

"I worked in computers twenty years ago and I've always had an interest in computers and the Internet, web site design and so on, so for us it was just a natural addition to the existing brochure that we mail out on a daily basis, and the information that we give over the phone. For us it wasn't like... as automatic as having a fax machine. You know, you have to have a presence on the Internet, and it's got to the point now where we feel if you haven't got a web site or at least an e-mail address, then basically, you're not really in business." (HHP).

Similar to these findings a study by Al-Qirim found that the CEO's innovativeness can be a driver for the use of e-mail for external communication (Al-Qirim 2007, p. 468), and Mirchandani and Motwani report how the enthusiasm of the top manager/CEO toward electronic commerce is an important factor for e-commerce adopters (Mirchandani & Motwani 2001, p. 70).

For WDC, a company classified as an "old fashioned SME" the situation is very different. Even though the driver for e-business was again the interest in technology of an employee, the company stopped their e-business involvement the moment this employee left the company as the management could not see any value in using e-business

205

"It was purely a person that we took on, that was very conversing with computers, and he designed the web page and get it connected with BT, but he didn't last long. (...) He was more interested in computers than human beings. (...) He was great at a computer, but when it came to reality, dealing with people that coming here, which is where the business comes from then he was no good. He was alright tap tap tap tap tap on the screen." (WDC).

This example shows how dependent this driver is on the attitude of specific employees and that it is difficult for this driver to become part of the overall culture of the company.

Customers

Customers as a driver for Internet and e-business technologies are closely related to necessity as a driver. This driver was especially important for e-adoption leaders, but was also mentioned by e-business strategy leaders. CNC said that employees didn't drive e-adoption at all and that there were no reasons for them to start using this technology, it was only

"because our customers and the other people that we deal with use it." (CNC).

For PDC this development was also driven by customers. When asked about the major influence in this context PDC replied

"I would say from our clients, our customers it's certainly been customer driven" (PDC),

when asked whether they felt rushed by the customers PDC answered

"we certainly haven't felt rushed. I think we always taken the view that we needed the facilities in place to be able to deal with the e-business as and when it began to increase in value." (PDC).

For GBC, a builder, the adoption of e-business technologies started slowly and was originally a management decision, but after being connected to the Internet, having an e-mail address and a web presence, pressure came from customers to make more use of this technology

> "one of our clients said that they thought we should.. they said that every.. all the communication on this project is by e-mail and that persuaded us to develop it sooner than we were planning to" (GBC).

Like for GBC for EMC the development was also customer driven and in relation to communication technologies

> "the majority of our customers like to receive data via e-mail as opposed to fax or printed literature" (EMC).

This finding relates to findings by Ballantine, Levy and Powell who describe the influence of major customers on information systems in SMEs (Ballantine, Levy, & Powell 1998, p. 245).

Communication

As seen from the comments by GBC the answers given by the companies sometimes indicate a causal relationship between different drivers. In GBC's case the customers demanded that all communication on a specific project had to be done by e-mail. This leads to another driver found among different companies: electronic communication. As a driver for e-business, communication was only mentioned by micro and small enterprises. Small enterprises use it for external and internal communication, while micro enterprises explained that they only use it for external communication. A possible explanation could be that micro sized companies do not have a very strong need for

internal electronic communication as individual employees are in close contact with each other and exchange information in a direct way, rendering internal electronic communication unnecessary: HHP answered that they have no need for internal electronic communication. EDM replied

> "not in a small office like this. I mean we send, you know, we send information between each other, and I might say, you know you deal with this and rather than printing it out or e-mail it or forward it, this type of idea, yeah." (EDM).

A similar situation exists for MDA and RFP, who do not communicate electronically for internal purposes.

Their size also means that they have a less formal relationship with customers and suppliers and do rely more on face to face communication. WDC tried to use e-mails, but never received any e-mails from customers and stopped using e-mails subsequently. Other micro companies seem to be in a state of transition, where they have some electronic external communication, but only a small percentage, as in the case of MDA. Other companies like RFP do not communicate electronically with suppliers, but sometimes with customers

> "Very rarely do they communicate. People would telephone, or fax, my domestic clients very rarely e-mail me. I would say one in a thousand e-mails, by comparison to telephone calls." (RFP),

but they still think it is important to offer electronic communication to customers

> "I think we're dealing with such a varied and wide category of people who are, who may or may not be used to using the Internet. Some people like to use t'Internet, some people don't, some people would pick the yellow pages up, but I'm aware that to apply to all categories of people, contact with yourself should be as easy as possible, so whether that's fax, telephone, Internet, e-mail, you must have 'em, they just got to run hand in hand." (RFP).

Only few micro sized companies like HHP do communicate with their suppliers electronically.

One reason why there is so little electronic communication with suppliers is that companies have established ways of ordering and reordering goods that they do not want to change.

While medium sized companies did not see communication as an important driver for e-business, small companies most frequently cited communication as their main driver. MCR mentioned that one of their main reasons for starting to use the Internet was easier communication, while the manager of STE explained how he tried hard to introduce e-mail early, because of its benefits. GLF summarised the reasons for introducing electronic communication as follows

> "[it] is becoming a more efficient way of communicating at less cost, so we would be silly to ignore it. " (GLF).

Findings from other studies support the view that communication is an important driver for e-adoption. In a study conducted in the USA before 2001 with companies between 20 and 500 employees, Riemenschneider, Harrison and Mykytyn found "that the improved social contact (with customers, vendors, etc.) facilitated by the Internet is the driving force behind web site adoption" (Riemenschneider, Harrison, & Mykytyn 2003, p. 283)

When companies start introducing e-business technologies to improve communications this is not always done voluntarily. When asked about introducing e-business technologies, RNH, a company that has a web page on the village web site, but is not connected to the Internet, answered

"I've been thinking about it more lately, because the eh government is make it compulsory for a business the size of us to do our tax returns etc. pay as you earn, the wages, income tax et cetera by e-mailing information, so that's fairly soon" (RNH).

Even though not all these forms have to be submitted electronically HM Revenue & Customs makes it gradually "compulsory for all employers to file a number of key PAYE returns and forms online" (HM Revenue & Customs 2008) and "expect employers with fewer than 50 employees to have to file these forms online from 6 April 2011." (HM Revenue & Customs 2008).

Curiosity

While some companies were driven by technical interest other companies were just curious about e-business without having a specific interest in technology. PSF explains

"I think when we first started it was just a novelty." (PSF),

before explaining how e-mail changed from being something used privately to being something used in business

"You know, it seemed to be e-mail was something people were doing privately and then if you look at how fast it's moved now if somebody in business doesn't have an e-mail address, than it's.. you can't believe it.. but four years ago nobody had e-mail addresses, now you have to have an e-mail address, so it's moved very very fast. We were talking with a customer the other day that didn't have an e-mail system yet, it was almost unbelievable they didn't, so it's moving very very fast." (PSF).

For MDA using the Internet also started out of curiosity

"it was more of an interest really, and the surprise came how useful it was in business. We weren't aware, it was more of an interest in wanting to bring it into

210

the laboratory and eh.. as I say we were quite surprised how useful it was."
(MDA).

Business growth / cost reduction

Business growth and cost reduction were usually mentioned together when the interviewees talked about them as drivers for e-business. This driver is related to the necessity driver as increased business can be seen as a competitive advantage. Especially for micro, but also small companies, cost reductions were a driver for starting e-business. PBM, a micro-sized company and the company with the highest level of e-adoption stated that cost reduction were the main reason for starting to use e-business. They started their e-adoption by replacing letters sent to customers with e-mails, because it

"made financial sense to do it" (PBM).

Now they are in a position where marketing and advertising is done electronically and where their services are created electronically and delivered electronically, resulting in them only needing half the number of staff. For MFH cost reduction was also a reason as e-commerce enabled them to source unusual parts that were previously difficult and expensive to source. For EDM the move to buying from suppliers online was also made because of cost.

"The major influence I suppose was the fact that eh we got a better discount, we got an increase, better terms, better buying terms.. two percent, which in our business is a lot." (EDM).

For medium-sized companies in this study cost was not mentioned as a driver for e-business, but the need to increase business, a closely related factor was. One possible reason could be that their size already put them in a better bargaining position than

211

smaller companies so that they do not need e-business to help reduce costs. The main driver for HOT, a medium-sized company, was to use e-business to directly increase business:

> "It's the future. I mean it's as simple as that, I mean if you look at our competitors, the competitors do use it to different levels, but it is the future I mean we get probably 10% of our business now comes through webpage, you know which is a significant amount of the business, we're always asking the question where did you hear about us" (HOT).

HOT then explains how customers use the computer more than in the past to buy products and book services. For HOT e-business is becoming so important that they employed an e-commerce manager just two months before the interview was conducted to look at e-business opportunities in order to generate more business though the Internet, create better connections between different sites of the company and to better promote the business online.

Research

Research can also be a driver for the introduction of e-business technologies that can lead to higher levels of e-adoption, as in the case of EMC:

> "We started using the Internet... gosh, I can't even remember when.. oh seven , ten years ago, primarily for research in the first place" (EMC).

Since then EMC integrated e-business technologies more and more and is now an e-business strategy leader. FCR also saw research as an important driver for e-business technologies, but after it tried out e-procurement with disappointing results it stopped using e-business technologies altogether.

Marketing

Among e-business strategy leaders and e-adoption leaders, marketing was also an important driver. Even though this is not a common driver for e-adoption in academic research, it has been mentioned in other studies (Lee 2001, p. 203). IDG described marketing as their only reason to start using e-business technologies:

> "It's another way of marketing the company, another way to get people to know you. That's the only reason really. It's another way to get customers to actually find you." (IDG).

RRA also said that marketing was their major influence to use the web. Similarly EMC uses e-business technologies to inform customers about their products

> "we put a very simple website on, which covered our product range, so we could point people from around the world at our products [...] we can have our brochure in a PDF format so we can e-mail it to people so e-mail is used all day, every day and it's just a very good form of access to our customers" (EMC).

Inhibitors

While the interviews helped to uncover drivers for e-adoption, they also showed what factors were perceived as inhibitors by the companies.

SDS feels that their company is not ready yet for using e-business as their existing business structures could not be easily adapted, partly because of the business partners it deals with, and feels that it is

> "not in a position yet to develop a website and sell things directly to members of the public" (SDS).

They have two concerns when it comes to the introduction of e-business in their company

"One is that we must make sure that it wasn't a distraction if you like from our main business, and secondarily, we'd have to make sure that we had the appropriate warehousing and the appropriate picking systems and so on and so forth in order to accommodate that type of business, and at the moment our internal stock logistics is something that we try to improve, so at the moment I would say that our stock logistics aren't really good enough to service the store without trying also then to use our existing stock logistic to service a website." (SDS).

SDS also described how they intend to update their current system to use e-business technology to automatically reorder stock, but they have no way of ordering products they do not know yet as their suppliers do not have electronic catalogues. Another aspect is that even if there was an electronic catalogue they would

"want to see new product almost in the flesh of it. Either at a trade store or in-store" (SDS),

but once they ordered new products they would be able to reorder it electronically with their new system that is linked to their stock level system.

CNC, a small company working in the area of computer networks, has the expertise to expand e-business and sell online, but chose not to as they think that e-business is more suitable for smaller value items and contracts, not for the type of contracts they deal with:

"If your doing large value contracts, you have to actually go our and physically get them. Just putting an e-mail on a web site out there and hoping that someone's gonna click on it and give you an order for the whole fifty thousand, sixty thousand pounds it's not gonna happen. It's very competitive, so you have to be aware of what's happening out there and actually go and physically make your presence felt (...) whereas if you just rely on an internet site it's just not

214

gonna happen, it's like putting your e-business in the yellow pages and hoping someone's gonna ring you up and give you a hundred thousand pound order, it's just not remotely gonna happen." (CNC)

WDC already used e-business technologies in the past, driven by one employee, but stopped when the employee who drove the e-adoption left. WDC think that tailored products and the nature of its business is unsuitable for e-business as their products, windows, have to be fitted at the customers premises which makes quoting a price impossible online without studying the customers premises.

FCR, a company in the gastronomy trade, introduced e-procurement before, but had problems with their e-business transactions and reverted to traditional procurement to avoid further problems.

For RNH, a company in the health and social work industry, lack of technological knowledge is the main inhibitor, a factor found to be an implementation barrier in other studies as well (Arendt 2008, p. 103). They see themselves forced to introduce e-business technologies to comply with government regulations, but they do not have the knowledge in-house to fulfil these requirements, specifically they do not know how to start introducing e-business technologies into their companies and what the requirements would be and they are also unclear about the influence this would have on their business.

The perceived inhibitors found seem to belong to one of three types:

- Products or services are believed to be unsuitable for e-business, as in the case of WDC, where products have to be fitted for each individual customer. In this context it has to be said that other companies like PDC have shown that online

tendering can be a way to use e-business technologies for originally unsuitable products and services.

- Problems with e-business and technology or lack of technological knowledge within the SME, seen in the case of FCR, where online orders resulted in wrong products being delivered, and RNH, where there is a lack of ICT knowledge.

- An unsuitable business structure that is difficult to adjust without disturbing the existing business, seen in the example of SDS where the introduction of e-business is seen as a distraction form the core business and where appropriate warehouse and picking systems would be difficult to set up without affecting the traditional business. This inhibitor has also been encountered by RFP, who try to circumvent these problems by setting up a sister company focussing exclusively on e-business while the business structure of the existing company remains largely unaffected.

6.5 Benefits of e-business strategies

During the interviews the interviewees were asked whether they can see any benefit in working out a strategy for the future of e-business in their organisation. While four companies were not sure whether the advantages of creating an e-business strategy outweigh the disadvantages, another four interviewees were in a position where this question did not apply to them for different reasons. Another eleven companies could not see any advantage in creating a strategy for the future of e-business, while ten companies saw an advantage in creating such a strategy. Cluster groups where interviewees predominantly could not see these advantages include the "blind e-business users" and the "e-adoption leaders", while the "formal strategy leaders" and the "e-business strategy leaders" did see advantages in strategies for the e-business

216

future. When trying to group the advantages seen by the companies together four main purposes of the strategies can be seen:

- Predicting the future situation

- Help the company to expand

- Improving the company's situation

- Justification of decisions

Planning for future situations

Most companies that were thinking about predicting future situations through e-business strategies were medium sized companies and belonged to the "e-business strategy leaders" group. One possible explanation, why smaller SMEs and less strategic thinking SMEs did not use e-business strategies to predict the future could be that companies do not have a strong need for strategies until they reach a certain size (Pleitner 1989, p. 72) and are therefore making less use of strategies than the "e-business strategy leaders" and medium sized companies.

When asked whether they can see any benefits in working out a strategy for the future of e-business the medium-sized company CAA (chartered accountants and business advisors who were classified as e-business strategy leaders) explained how they plan the future further integration of customers into their information systems:

> "There's always benefits in planning strategies, you know it does make a lot of sense to think well in five years time [...] a client could access their account's information directly via the web, [...] that is what we would term a long way off, as I said certainly a few years down the line that would use our web site as a resource for clients as well so they can access their own information instead of

having to ring us up, […] as more and more people use computerised records they can send their books in via the Internet or an e-mail connection, so yes there would be an advantage in planning it because you sort of know more about it and then when you think technology's become available you think Ah, that is something we want." (CAA)

Even though a five-year planning horizon is not uncommon for normal business strategies CAA seems to be one of the companies planning their e-business strategy further ahead than many other companies interviewed by also applying a five-year planning horizon to their e-business strategy. Currently they have not adopted e-business technologies to a great extent as they are using a web site without e-commerce and are therefore on the second stage of the DTI's e-adoption ladder, but their strategy seems to lead them towards further integration of e-business technologies and a higher position on the e-adoption ladder.

Another e-business strategy leader, SLS is also working in a regulated profession. They are a small company of solicitors and use e-business strategies to plan for change:

"I'd say the benefit [of working out a strategy for e-business] is the same as the benefits of any form of planning, is so that you.. you can plan for the change and make sure it actually happens rather than just it being how to say, you know spontaneous change or change that or maybe change that comes about because you haven't planned it, you're forced to do something, so I think there are lots of benefits in planning what we're going to do for the next twelve months and if we require resources like manpower and maybe extra staff or extra cash you need to plan for that too." (SLS)

SLS describes itself as a very traditional "local firm for local people" (SLS) with many clients who have been with them for generations. Even though SLS's profile is not the profile of a company that has to use e-business technologies because of external pressures they liked the idea of using e-business technologies for different purposes

218

ranging from research to internal and external communication, and found out that the use of e-business technologies even helped them to attract new customers, even though this was not the objective behind the introduction of e-business technologies. SLS is proactive and their planning helps them to create benefits in all areas of the business from reducing cost and increasing speed to improved communication, customer retention and attraction of new customers.

PDC, a medium-sized painting and decorating contractor classed as an e-business strategy leader, is using e-business strategies to make sure that they are not missing future opportunities:

> "I think the main advance of the strategy is you're in a position to make sure, that you don't miss any future opportunities in your industry. [...] I think it's just part of commercial world in which you now operate, you have to have a strategic viewpoint on the operating role of your business." (PDC)

In the future PDC wants to use e-business technologies to a greater extent to promote their company and to contact other companies as

> "the days of the high sales salesman will fall into insignificance" (PDC).

Competing with companies nationwide PDC is experiencing a transformation of the market as big clients introduce online tendering and as PDC is using e-business technologies in more and more different areas including recently the addition of using e-business technologies to integrate checking the credit rating of new potential clients.

HOT, a hotel classed as a medium-sized SME and e-business strategy leader, is using e-business strategies as a tool that helps them to find out where they want to be:

> "It's same in every part of the [...] business, you do need to have a strategy what where do you expect to be in a year's time, two year's time, what's our expectations. Again, our expectations have changed in the last couple of years from

[…] we've got the idea was to have a web page and people would use it [to] we've got a web page, people using it will now be well aware more people are wanting to use it and the potential is there, but we need to develop it, so there will be a strategy for the next two, three years, four years time, just like we do a three year marketing strategy for the hotel. Included in that would be […] the e-commerce site of the business, because again, it still is 10% of the business, […] in a year's time 10 % that could be you know maybe kind of 16% […], so in line with that we need to develop. The strategy going forward is that we need to continue to develop, you know kind o' our e-commerce." (HOT)

HOT has recently employed a dedicated e-commerce manager to develop this side of the business and as they expect that the proportion of business generated through e-business is going to increase, they are willing to spend more of their strategic planning on planning the e-business development and develop it further though the new e-commerce manager.

Even though these companies are competing in different industry sectors the use of e-business strategies to prepare the company for the future seems to be rewarding.

Expanding the business

Another theme when looking at the reasons for the use of e-business strategies in the interviewed companies was their use with the main objective of expanding the business.

HOT has already been discussed when the use of e-business strategies for planning and preparing of the future has been described. As they expect the business generated by e-business to grow they also use e-business strategies as means of expanding the business.

CAD, a micro-sized design engineering company classed as a formal strategy leader, is using e-business strategies to "expand the business" (CAD). Their main focus for the moment when it comes to e-business is to enable this expansion by developing the marketing and sales side further. Taking the fast paced e-business environment into account CAD said that

> "all these things are dynamic, so whatever strategy we had, we'd review it constantly" (CAD).

Like HOT they recognized the increasing importance of e-business and are committed to developing e-business further by employing a new member of staff whose responsibility will be the web site of the company. E-business technologies are already used for communication, buying and selling and research (researching technical information to support projects, but also to find information about suppliers, competitors and customers).

GLF, a small company providing golfing and leisure facilities and classed as an e-adoption leader, is using e-business to attract customers. Their industry recently underwent some changes from a situation where there were more customers than facilities to a situation where different companies might have to compete for customers soon.

> "A lot will depend on how our market changes in the next two to three years. Up to now we had a waiting list, we've had no shortage of new members, but the market is changing, eh.. some people have suffered a lot with those changes. Many, eighty percent of clubs in the country suffered a lot in the last few years and now don't have a waiting list. We still do have, but we can see that in the next year or two that could change. Now if it does, we're gonna have to change our strategy, because the way the market we go chasing is going to change as well." (GLF)

GLF has seen a change in customers attitudes towards e-business where the increased use of the Internet by customers means that the company is changing its own attitude towards e-business technologies

> "I think we would change our strategy as our own members themselves begin to use this as an everyday thing, rather than a luxury" (GLF)

This caused a change in GLF's strategic thinking and in their policies, but rather than already implementing their new e-business strategy their strategy is in the form of a contingency plan, to be executed if the lack of new customers forces them to use more e-business.

> "No, there's no disadvantage other than the strategy will be a contingency plan in the event of certain things happen, as we are at the moment, it doesn't mean any great strategy, the development of our members using the facility will dictate that, but if the market changes and we're beginning to suffer in this hard, competitive market more, then yes, we will have to change that strategy." (GLF)

GLF's e-business behaviour is very much influenced by their customers. The company started to think about e-business because of their customers using it more often, and creating a real e-business strategy integrated with their business strategy will only take place if the market, i.e. the lack of customers, would make this necessary.

Improving the business

Instead of looking at e-business strategies as means of expanding the business and entering new markets some companies also see the improvement of their existing business structures as the main benefit of the introduction of e-business strategies.

MDA, a micro sized manufacturer of dental applications for the dental profession, classed as an e-business strategy leader sees saving time and money as the main benefit their company can achieve through the use of e-business strategies.

> "It's always an advantage to work out a strategy. Everyone needs a plan to work to. [...] The initial planning is very important and it will save you.. could save you a lot of time and money in the long run." (MDA)

They would like to integrate e-business further in some areas, mainly for the communication and exchange of information with their customers, as the use of Internet technologies brought them advantages in terms of reduced correspondence time, but further integration is currently not possible. Communication itself is already done electronically, but orders from customers need to be sent together with a physical model or impression from the dentist for MDA to work with. The technology is already available to transmit scanned information instead of sending a model, but can only be used for parts of the company's processes at the moment. Integrating new technologies into e-business has the potential of saving even more time and money for MDA.

EMC, a small electronics manufacturing company classed as an e-business strategy leader, started to use the Internet about ten years ago and is using e-business technologies successfully. For them using e-business strategies is seen as very important as they feel that they can achieve more through planning.

> "I'm sure with a bit more coordination we could achieve a lot more. You know, we've achieved what we set out to achieve, and that I think is working reasonably well, but with a bit more coordination, a bit more planning yes, I think there is more to come out of e-commerce, definitely." (EMC)

Their plans do not include implementing e-business for its own sake. Selling online was ruled out for the near future as EMC is selling to other companies, not to end-users, and

some of their big customers do not like to use other companies' ordering systems while for other customer the person ordering from EMC has no access to financial information necessary to complete the transaction.

Justifying decisions

RFC, a medium-sized farmer cooperative, classed as a blind e-business user, is in a very different situation compared to many of the other SMEs interviewed, as they are a farmer owned cooperative. RFC sees the farmers as shareholders who will receive a share of the profits made by the cooperative at the end of the year. The biggest benefit RFC can see in working out a strategy for the future of e-business would be to use them to make presentations to the board to justify the decisions taken in relation to e-business. RFC does however think of its business environment as very unstable, especially when it comes to legislation, as regulations concerning the ability to sell specific items can easily change after a period of uncertainty regarding the regulations. RFC gives an example:

> "[uncertainty] that's the problem, so you almost have to ignore that it is gonna happen, you've also almost gotta ignore that European legislation might make us not able to sell cattle worms for example, that's currently going through the EEC to see whether it's vet only or whether we're able to sell it, so you could make a tremendous strategy that would then go down that route and the big benefit is that because of that [the strategy would be wiped out], but if you looked at that, everything like that, you'd do nothing would you, you almost gotta say right we are where we are, that's the strategy we're going for." (RFC)

This uncertainty prevents RFC from creating e-business strategies even though they understand today's importance of e-business as shown on p.200, but unlike GLF, which

224

created a e-business contingency plan (see p. 222), this uncertainty results in RFC not having an e-business strategy at all.

6.6 Summary

This chapter started by presenting the qualitative data collection, namely the pilot and the main interviews before looking at the companies from the different groups.

Old fashioned SMEs were disappointed by their previous e-business experience or had insufficient skills and financial resources to increase their e-adoption. Strategic planning was either too rigid or virtually non-existent in the companies in this group.

Blind e-business users were very passive in relation to the adoption of e-business technologies and only show rudimentary signs of strategic planning.

Formal strategy leaders only used simple technology like e-mail. They use strategies for their business and know more about strategic models than companies from other groups, but they do not use this knowledge to plan the e-business side of their company.

E-adoption leaders use e-business technologies extensively and especially micro sized e-adoption leaders were able to benefit immensely from the use of e-business technologies. Their e-adoption was often technology-driven and happened without careful planning.

E-business strategy leaders were not leading when it came to e-adoption. They tend to be in industries with the need for formal planning and their skills of integrating the e-business strategy and the business strategy made them successful when it comes to e-business.

It is not possible to reduce the characteristics of firms that have successfully adopted e-business to a defined set as the interviews did not reveal desirable typical characteristics that enable SMEs to become successful e-adopters. Instead successful e-adopters use e-business in unique ways tailored to their specific situation, i.e. industry, network of customers and suppliers, IT knowledge, and other distinctive attributes. Some successful e-adopters and e-business strategy leaders like MFH would be capable of higher levels of e-adoption, but are already driving e-adoption to the maximum levels possible in their environment. Other companies like PDC cannot easily use e-business technologies to offer their products and services because their services need to be tailored to individual customers, but they still managed to successfully adopt e-business through embracing new developments like online tendering. Other companies look at possibilities of driving e-adoption to and above the current limit in their industry sectors. This is the case with MDA and HHP who want to use state of the art technology to drive e-adoption forward, SLS which is embracing e-business technologies for their knowledge based resources or PBM which automated most tasks in the company using e-business technologies and is on its way to becoming a transformed organisation, the highest level on the DTI's e-adoption ladder.

The findings from this chapter also included several drivers for e-business, namely necessity, technology, customers, communication, curiosity, business growth/cost reduction, research, and marketing. These drivers can be further supported by other

factors observed in several companies, like the presence of an IT champion, the influence of customers and people companies deal with, the existing IT skills of the owner/manager or the introduction of a new owner/manager with IT skills.

The findings further included the discovery of four main benefits of e-business strategies as seen by the SMEs:

- Predicting the future situation
- Help the company to expand
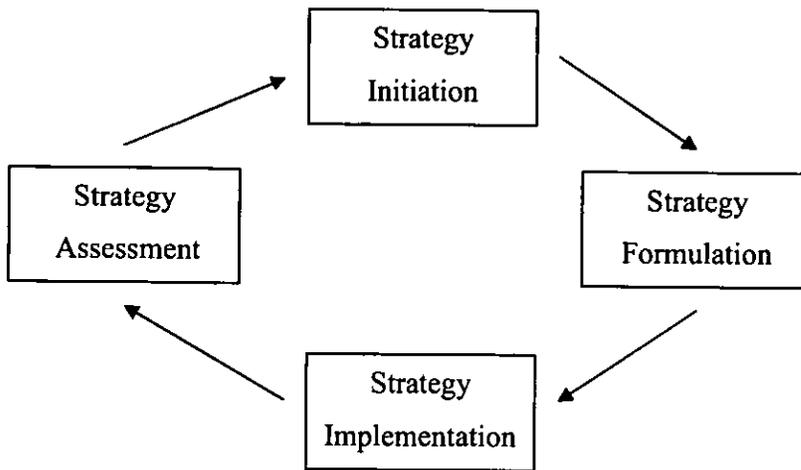- Improving the company's situation
- Justification of decisions

7 Strategic model

7.1 Introduction

Many strategic models do not take e-business into account. Typical strategic models of this type include the Analysis / Choice / Implementation model or the new Exploring Corporate Strategy model that includes Position / Choices / Action by Johnson, Scholes and Whittington (Johnson, Scholes, & Whittington 2008). Models that do take e-business into account like the Strategic Planning Process from Turban et al. (2008) do not give hands-on advice but tend to illustrate e-business situations with examples based on companies like eBay, Yahoo, Apple or Intel. The interviews have also shown that models known to SMEs involve a process of strategy that is far too detailed and time consuming for SMEs, which is what prevents them from using an e-business strategy as in the case of RFP who said that using e-business strategies is too time consuming, or RRA who said that e-business strategies are too rigid and a "waste of time". Companies like CAD and PBM also mentioned time restraints as a problem and a lack of knowledge how to plan strategically, while EDM and MFH emphasise that e-business strategies should be flexible and keep track of the environment constantly.

This chapter outlines a more realistic revision of strategy development for SMEs which can be used when SMEs enter the world of e-business. This rapid e-business strategy development is based on the research as outlined in the previous chapters.
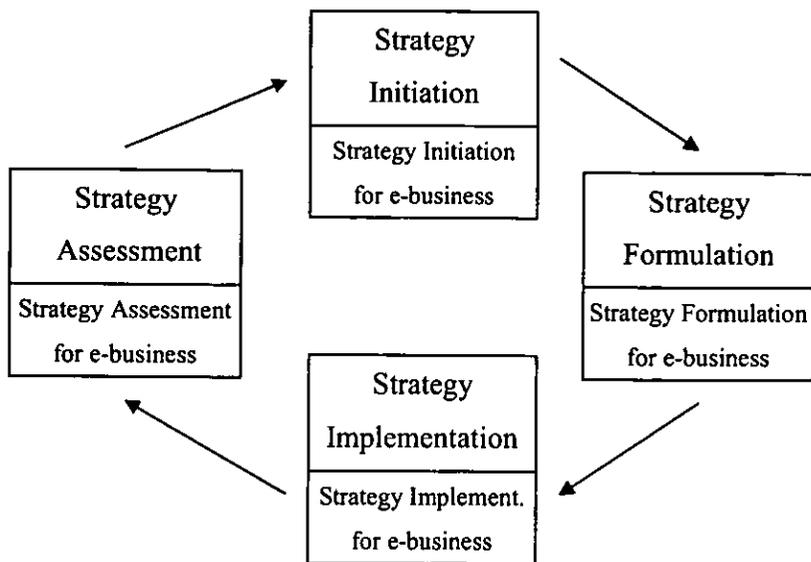
Turban et al. describe that any strategic planning process has four stages: strategy initiation, strategy formulation, strategy implementation and strategy assessment (Turban et al. 2008, p. 641).

Figure 7 Turban's Strategy Planning Process

During the Strategy Initiation phase a company gathers information. This information is then used to formulate a strategy. In a next step this strategy is then implemented. Ward & Peppard write that "it is obviously important both to monitor performance and to control activities to ensure actions taken are producing the specific results that will lead to achievement of the overall set of objectives" (Ward & Peppard 2002, p. 85). This is achieved in the Strategy Assessment phase, before this information is fed back to the Strategy Initiation phase when the cycle starts again.

The rapid e-business strategy development presented in this chapter is based on Turban's Strategy Planning Process but expands each phase by an additional e-business component based on the findings from the quantitative and qualitative data analysis that is always presented after the according phase (see Figure 8). The e-business components presented in this chapter are a contribution of this research and always follow the presentation of Turban's original phases that will be presented briefly to help understand the e-business components and to put them into context.

229

Figure 8 Strategy Planning Process and e-business component

7.2 Strategy Initiation

7.2.1 Traditional Strategy Initiation

During the strategy initiation stage a company gets a clear picture of its own properties, of its environment and how the environment, including competitors, impacts on the own company. Turban et al. (2008, p. 641) describes four outcomes from this phase:

- Company analysis and value proposition
- Core competencies
- Forecasts
- Competitor (industry) analysis

230

While the company analysis can help companies to understand their business, the value proposition is describing how the company's product differentiates itself from similar products or services offered by competitors and what benefits it offers to customers.

Looking at the core competencies can support companies by making them aware of their specific resources and experiences. Knowing them, so that they can be used to their advantage, can be valuable as they would be different from the resources and experiences of competitors. Using the core competencies correctly can be very advantageous as competitors would have to build the experience or get the resources first to be able to deliver the same product or service.

Identifying which trends might influence the company's business in the future is also part of the strategy initiation phase and makes it possible to include these trends when formulating a strategy in the next stage.

The competitor analysis is important as it provides information about the competitors of a company and the industry the company is in. Porter states that "the essence of formulating competitive strategy is relating a company to its environment" (Porter 2004, p. 3), which shows that the knowledge gained in the Strategy Initiation stage is important to make informed decisions in the Strategy Formulation stage.

A very popular tool that can be used in the strategy initiation phase is the strengths, weaknesses, opportunities, threats analysis (SWOT), which was used by 67.1% of the respondents from the quantitative stage of this research (see Table 22 on page 111). This shows that many SMEs examine themselves and their environment as part of the

231

strategic planning process not only implicitly, but even explicitly using well-known tools and methods.

7.2.2 Strategy Initiation for E-Business

Company analysis

Analysing the own company is an essential part of the Strategy Initiation phase. During the Strategy Initiation phase of the traditional strategic planning process a company would look at what business it is in or what benefits their products or services provide or what competencies they have. Analogous to the traditional Strategy Initiation phase SMEs should also get a better idea of their current level of e-business for the Strategy Initiation phase, so that they can make informed decisions in the Strategy Formulation phase. Finding out how the company would be classified in the e-adoption strategy classification is the first step.

As described in chapter 5.3.3 "Identification of cluster groups" the quantitative stage of this research found five different types of SMEs in relation to their strategy, e-business strategy and e-adoption

- e-business strategy leaders
- old fashioned SMEs.
- blind e-business users
- e-adoption leaders
- formal strategy leaders

To find out how they would be classified in the strategy and e-adoption classification SMEs need to ask themselves

- whether they have a formal strategy for their business

- whether they have a formal e-business strategy

- what stage they are on on the DTI's e-adoption ladder

The diagram presented in Figure 10 offers a quick way of identifying which group a SME belongs to.

If an SME has an e-business strategy (labelled β on the e-business strategy axis) it should be seen as an e-business strategy leader. E-business strategy leaders are represented by the green colour in Figure 10. In the quantitative part of this research the e-business strategy group was the smallest group with roughly a third of the members of the blind e-business users group. It is therefore expected that only a small proportion of SMEs will fall into this category.

An SME is classified as an e-adoption leader if it

- does not have an e-business strategy (labelled α on the e-business strategy axis) and is

- either

    o classified as doing at least e-commerce (labelled d on the e-adoption ladder axis) on the e-adoption ladder (DTI 2002), i.e. the company is at least buying or selling online, but could also have a higher level of e-adoption, like having the e-business processes integrated into their supply chain,

- or

233

o   if it is classified as having a web site (labelled c on the e-adoption ladder axis) on the e-adoption ladder (DTI 2002) and it

o   has a business strategy (labelled 2 on the formal strategy axis).

E-adoption leaders occupy the blue positions in Figure 9 and in Figure 10. The cluster groups found during cluster analysis were based on a more complex variate that has been condensed for the purposes of providing a model useful for strategy initiation for e-business, it is however worth mentioning that there were combinations of the variables that did not occur in the sample used in the quantitative stage. As described on page 126 there were no SME that were classified as transformed organisations, the highest stage of the e-adoption ladder (DTI 2002) and there were no e-adoption leaders on the e-commerce stage of the e-adoption ladder that had a verbally defined business strategy. It could be argued that for the purposes of strategy initiation the e-adoption leader group should be split into two groups: the e-adoption leaders with a higher level of e-adoption and less use of business strategies and the e-adoption leaders with a high use of business strategies and a low level of e-adoption (see Figure 9), but the dendrogram (see Figure 5) and the abbreviated agglomeration schedule (see Table 23) do not support this split. The quantitative analysis also suggests that a split would provide an unbalanced mix of group sizes as the second smallest group of this taxonomy would be split even further. The group was therefore left unchanged even though a split would be possible and the growth of this group in the qualitative data analysis stage meant that it was not one of the smallest groups anymore as shown in chapter 6.3.4. SMEs on the e-commerce stage of the e-adoption ladder that have a verbally defined strategy should be counted as e-adoption leaders.
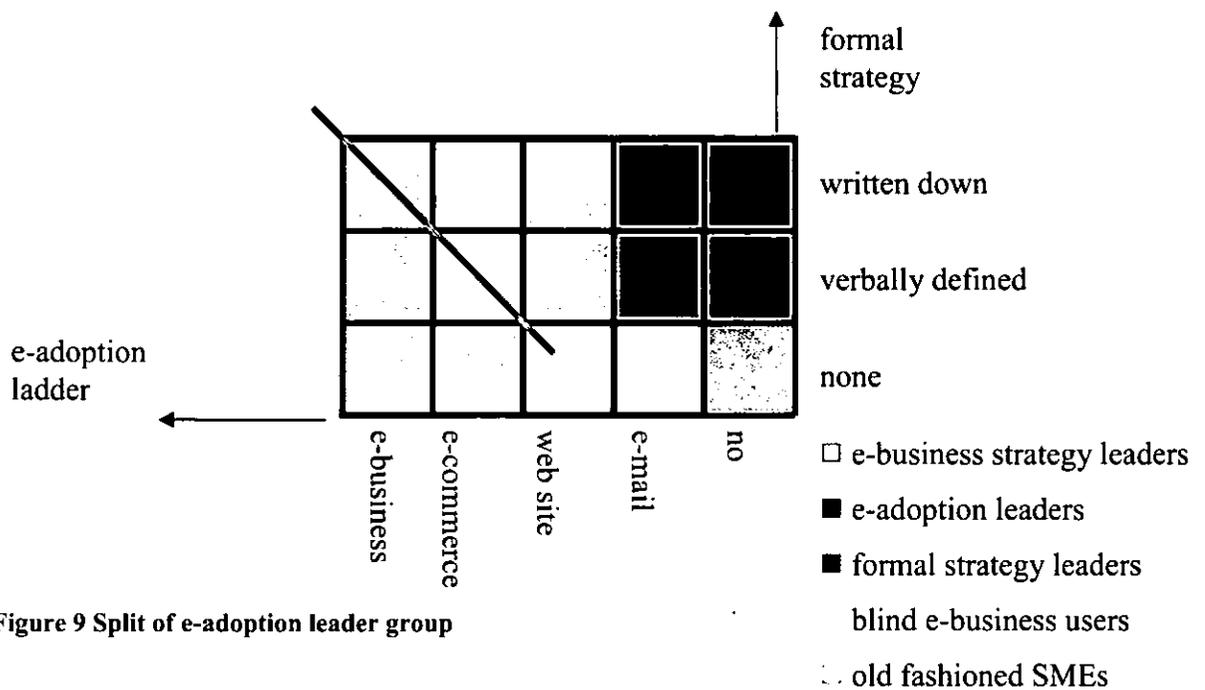
formal
strategy

written down

verbally defined

e-adoption
ladder

e-business

e-commerce

web site

e-mail

no

☐ e-business strategy leaders

■ e-adoption leaders

■ formal strategy leaders

blind e-business users

∴ old fashioned SMEs

Figure 9 Split of e-adoption leader group

Formal strategy leaders are SMEs that

- do not have an e-business strategy (labelled α on the e-business strategy axis),
but

- have a business strategy (labelled 2 on the formal strategy axis) and

- have a very low e-adoption ladder (DTI 2002) classification, i.e. they either do
not do any e-business (labelled a on the e-adoption ladder axis) or they reached
the e-mail stage on the e-adoption ladder. Formal strategy leaders are
represented by the purple blocks in Figure 10.

The biggest group that was found in the quantitative stage was the group of blind e-
business users. SMEs are classified as blind e-business users

- if they do not have an e-business strategy (labelled α on the e-business strategy
axis) and

- if they do not have a business strategy (labelled 1 on the formal strategy axis)
and

- if they started the introduction of e-business technologies, but are still on the
lower stages of the e-adoption ladder, i.e. they are either on the e-mail stage

235

(labelled b on the formal strategy axis) or on the web site stage (labelled c on the formal strategy axis).

Blind e-business users occupy the yellow block of the model in Figure 10 and are described in more detail in chapter 6.3.2.

The last group is the group of old fashioned SMEs, which is made up by SME that

- do not have an e-business strategy (labelled α on the e-business strategy axis) and

- do not have a business strategy (labelled 1 on the formal strategy axis) and

- do not use any form of e-business and are on the lowest level of the e-adoption ladder do not have a business strategy (labelled a on the formal strategy axis), meaning that they do not have a web site and do not use e-mail. This could mean that the companies are using the Internet to look at web sites, e.g. of competitors.

The interviews have shown that some old fashioned SMEs have increased their level of e-adoption and moved to other cluster groups as discussed in chapter 6.3.1.

e-adoption
ladder

formal
strategy

α

β

d

c

b

a

1

2

☐ e-business strategy leaders

■ e-adoption leaders

■ formal strategy leaders

  blind e-business users

⊑ old fashioned SMEs

e-business
strategy

Figure 10 Strategy and e-adoption classification for SMEs

Value proposition

While finding out how the own company would be classified in the e-adoption strategy classification is useful to get an explicit overview of the current level of e-adoption and strategy, an e-business equivalent of the value proposition should also be an important part of the strategy initiation phase for e-business. Companies should have a clear understanding of the current benefits of their e-business involvement. Benefits found by companies interviewed for the qualitative part of the study included

- improved communication (internal / external)

- increased business (bigger share of market / new markets)

- improved marketing

- better research

- procurement & cost reductions (better buying terms / discounts / new suppliers)

- reducing work (automating processes)

These benefits were often interconnected. Some of these benefits also relate directly to the benefits of the company's e-business involvement to the customers, e.g. improved communication and improved marketing, while other benefits like automating processes or better research can lead to an improved experience for customers who can access information about products or orders through the Internet.

When looking at e-business it can be logically split into procurement and sales. E-adoption is not always possible in both areas, therefore looking at the benefits of the integration of e-business technologies for the company and its customers is important to help making the right decisions in the next phase of the strategic planning process. Being aware of the benefits, the lack of benefits or even disadvantages when it comes to e-business technologies is important as seen from the example of EDM, which has the technical capabilities to deploy e-business technologies when it comes to sales, but does not do so:

> "We do use the Internet for e-business, [...] but for selling we don't. [...] We operate in Cumbria, in North Lancashire, and narrowing your geographical area on the Internet isn't easy [...]. Our main customers are [a Billon Pound public company wholly owned by the UK government] and [a Billion Pound public company quoted on the London Stock Exchange] [but] e-business would then open up and allow us to sell these same wares as we're selling there to Joe Bloggs in Timbuktu, but [this] would distract us from our main core business [...]. So if [the Billon Pound public company wholly owned by the UK government] and [the Billion Pound public company quoted on the London Stock Exchange] want to buy using e-commerce we're here and ready to do so, to sell to them, but they don't wanna buy that way, so we don't sell that way. It

has to be customer driven, we're a small company, six employees, we can't dictate to [the Billon Pound public company wholly owned by the UK government] how they deal with us and we just have to fit in with their plans, and their plans aren't for e-commerce. [...] Well, they ring up and say, just like I said, these marvellous words 'Have you got' and 'How much' and we then invariably give them a price and we get an order on the fax machine. The fax is the answer. That's how we get our orders." (EDM)

E-business competencies

While the core competencies express a company's resources and experiences in their field of business, their e-business competencies show their resources and experiences in relation to e-business technologies. When asked e-business specific questions during the interviews in the qualitative stage of this study many companies actually talked about their general, not-Internet related IT situation. This could indicate a stronger need for managers to understand IT and its different areas and their impact on the company and a stronger need for managers to understand how their IT competencies and their e-business competencies fit together and interrelate. When examining their e-business competencies companies should look at their current competencies at the different levels of the e-adoption ladder. Findings from the interviews show that smaller SMEs and SMEs occupying lower levels of the e-adoption ladder often do not have own e-business competencies. As they do not see these functions as an important part of their business they are outsourced or provided by third parties. Not surprising this includes in most cases hosting of e-mail services and web site hosting. The creation of a company's web site is also commonly done by specialist companies, with some companies deciding to update the content by themselves. As e-business functionality often has to be implemented only once and does not need constant updating of functionality, companies

only possess the competencies to update and expand the content of their e-business systems, not the functionality. "High" e-business competencies were usually only present in

- companies so big that maintaining own e-business was even justified if e-business was of small importance
- companies on the higher levels of the e-adoption ladder
- companies where the business generated by e-business account for a big proportion of overall business

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Forecasts

Turban writes that "Forecasting means identifying business, technological, political, economic and other trends that are currently affecting the business or that have the potential to do so in the future" (Turban et al. 2008, p. 642). Forecasting in the context of e-business means identifying Internet trends that affect or might affect e-business.

On one hand the technology used on the Internet is being updated constantly. While web sites were static in the past they are now very dynamic, consisting of a mix of client and server-side scripts that even communicate with each other since the introduction of AJAX in 2005. There are new technologies being used that help create and update web sites faster, like CMS, and there are new possibilities to integrate the web and the business systems, with technologies like XML.

On the other hand many customers expect better designed web sites in terms of their look and functionality, which means that a poorly designed web site or e-business application can give the customers a very negative impression of the company.

Identifying Internet trends can be a difficult task, especially if a SME does not see the Internet as an important part of their business and has therefore few e-business competencies. Forecasting how e-business develops in the own industry sector could also be seen as part of forecasting, but is covered separately next.

Competitor / Industry analysis for e-business

The competitor analysis usually focuses on gathering data about competitors and relating this information to the own company. SWOT is a very popular methodology used in this context and guides companies when looking at the opportunities and threats of the external environment and when relating them to the company's internal capabilities, their strengths and weaknesses. As mentioned on page 231 SWOT was a popular tool used by the companies interviewed in the qualitative stage of this research and was by far the most used strategy tool (see Table 22 on page 111).

As part of the competitor / industry analysis for e-business companies should look at the e-business situation in their industry. Many of the companies interviewed examined their competitors' web sites on a regular basis and were looking at the level of e-adoption in their industry. Companies should know how the competitors differentiate themselves from each other and from the own company when it comes to e-business.

7.3 Strategy Formulation

7.3.1 Traditional Strategy Formulation

The Strategy Formulation phase is using the information acquired in the Strategy Initiation phase to create the company's strategy. Internal and external factors discovered in the previous stage will be taken into account. The forecasts from the previous stage can help to predict how the external factors will change in the future and how the strategy can help the company to deal with these changes. Opportunities discovered might be used for a company's advantage, while the threats have to be dealt with. Internally a company could work to reduce existing weaknesses, while using the company's own strength to improve it's future position.

Turban (2008, p. 642) lists the following activities and outcomes in this phase

- Business opportunities

- Cost-benefit analysis

- Risk analysis, assessment, engagement

- Business plan

If the information from the Strategy Initiation phase led to the discovery of new business opportunities, the company would have to evaluate whether these new business opportunities should be followed up. In the same way the Strategy Initiation phase might have discovered that existing areas of business no longer support the aims of the

company or might become less important in the future, in which case the company has to decide whether to reduce or restructure these areas.

For the Cost-Benefit analysis the benefits of the opportunities discovered in the previous phase are compared to the expected cost. The cost could be financial or non-financial but tangible, or intangible, e.g. providing a competitive advantage or increasing customer binding. A well researched Strategy Initiation phase will help to define the proposed opportunities better.

For the risk analysis, assessment and management the risks of proposed projects are analysed and assessed to enable better risk management if necessary.

The previous findings can be used by the decision maker to prepare a business plan, which is essential for businesses. BERR and the Regional Development Agencies offer help for companies through Business Link for preparing a business plan (Business Link 2009). According to Business Link a business plan should contain

- an executive summary
- a short description of the business opportunity
- the marketing and sales strategy
- information about the management team and personnel
- information about the operations of the business
- a financial forecast

7.3.2 Strategy Formulation for E-Business

E-Business Opportunities

When looking at business opportunities as part of the traditional strategy, scenarios for the future direction of the company will be assessed. As part of the Strategy Formulation for E-Business, e-business opportunities and their suitability for the company should be examined. The companies should look at their current group in the e-adoption strategy classification, namely
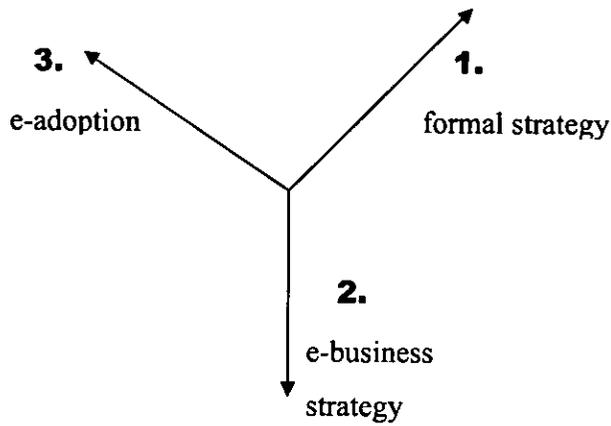
- old fashioned SMEs

- formal strategy leaders

- blind e-business users

- e-adoption leaders

- e-business strategy leaders

and decide using the information from the previous stage whether they want to stay in the current group or whether it is advantageous to move their own company to another group (see Figure 11).

Figure 11 Moving from the current e-adoption strategy

As the use of strategies is important for the traditional business area and for e-business, the aim of every company should be to be classified as an e-business strategy leader. Since having an e-business strategy was a relatively rare occurrence in the qualitative stage of the interviews, the e-business strategy leader group in the e-adoption strategy classification includes companies at different levels of the e-adoption ladder. All e-business strategy leaders did however also have a business strategy for the traditional business area, additional to their e-business strategy.

Figure 12 Suggested path of progression

The general advice for companies would be to progress first on the formal strategy axis (see Figure 12), this means that

- old fashioned SMES should aim to become formal strategy leaders

- blind e-business users should aim to become formal strategy leaders or e-adoption leaders

- e-adoption leaders should work on a business strategy if they do not have one already

Some of the companies interviewed for the study progressed from lower e-adoption and strategy groups to higher groups in the 18 months between the quantitative and the qualitative stage. As shown in Table 28 three of the old fashioned SMEs moved to the e-adoption leaders group, two blind e-business users moved to the e-adoption leaders group, and two formal strategy leaders moved to the e-business strategy leaders group. The fact that companies that changed their group moved up similar to the suggested path of progression supports the idea that the natural progression is to move along the three axis as shown in Figure 12.

As a next step companies should progress on the e-business strategy axis (see Figure 12). Having an e-business strategy will help them to understand their e-business needs, even if it turns out that there is no need to use e-business technologies or if it turns out that there is no need to increase the adoption of e-business technologies. Companies should therefore strive to become e-business strategy leaders.

The information gathered in the Strategy Initiation phase should give an idea whether the company should increase their level of e-adoption. There are six different levels of e-adoption, namely

- no e-adoption
- e-mail
- web site
- e-commerce
- e-business
- transformed organisation

The progression to higher levels of e-adoption might take different forms depending on the existing level of e-adoption. Possible progression paths are presented next, accompanied by examples from companies with similar progression as identified in the interview stage.

Progressing from low levels of e-adoption

If there is a planned increase of e-adoption, it should be opportunity driven. A typical opportunity afforded to progress from very low levels of e-adoption could be improved communication. When looking at progress upwards from very low levels of e-adoption

the benefits should usually outweigh the costs in the cost-benefit analysis in the developed, high income countries as defined by the World Bank (2009) like the UK, as access to computer hardware is relatively easy. The high level of access to computers and the high level of Internet usage in the UK (Demunter 2005) suggests high levels of computer literacy which should facilitate progress upwards from low levels of e-adoption further. Data from Eurostat suggests that small UK enterprises have fallen behind when compared to the average of 25 EU countries (before the 2007 enlargement, i.e. without Bulgaria and Romania and excluding France and Malta as well as micro-sized enterprises) when it comes to "just" having Internet access, which represents a low level of Internet adoption (Demunter 2005, p. 6), while medium and large enterprises match the EU25 average.

In his Adopter Categorisation on the Basis of Innovativeness Rogers shows five adopter categories with the approximate percentage for each category (see Figure 13) with the latest adopters, the laggards, making up approximately 16% (Rogers 2003, p. 281). The interviews in the qualitative stage discovered that there were four companies (13.8%) with a much lower level of usage when it comes to Internet technologies, which seems to support Roger's Adopter Categorisation. Two of these four companies stopped using Internet technologies, the other two were very reluctant when it comes to the adoption of e-business and Internet technologies (one because of a lack of knowledge, one because of a lack of necessity as the company is not really expected to make a profit).
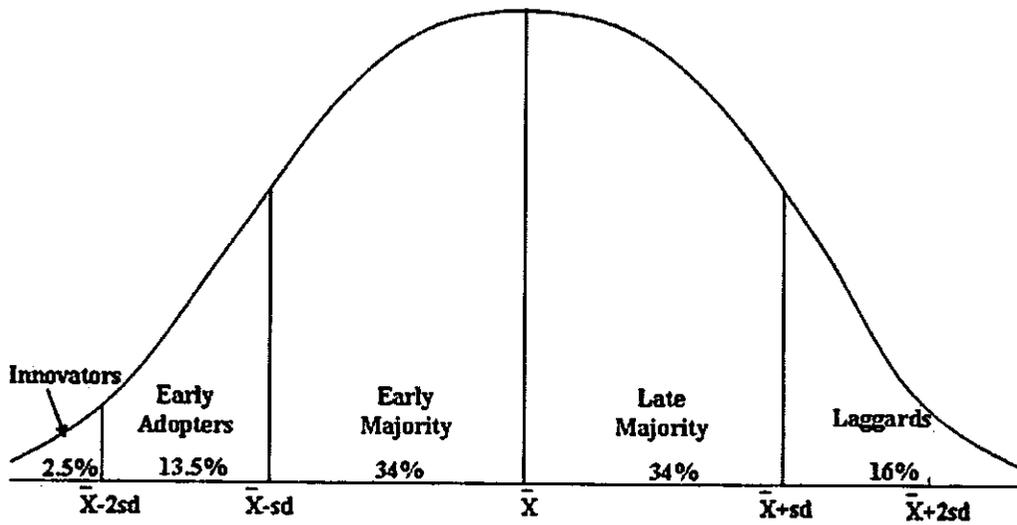
Figure 13 Rogers' Adopter Categorisation on the Basis of Innovation

There were very few interviewed companies who did not see making the first step on the e-adoption ladder beneficial. The two companies not wanting to be on the first step of the e-adoption ladder were companies who used e-business technologies previously, but decided to stop their use of e-business technologies. In these cases the reasons for not wanting to stay on the ladder were a mixture of previous disappointments, when unplanned e-adoption was not successful plus perceived low opportunities through e-adoption because of the companies' industry sectors and the type of customers the companies cater for.

The company that was reluctant to introduce e-business technologies because of a lack of knowledge of these technologies started e-adoption and was thinking of increasing their e-adoption because of government pressures, but did not feel the need for a higher level of e-adoption before, as it did not seem to offer benefits in terms of improved communication or improved services for their customers.

The last company did not introduce e-business technologies because it does not have to make a profit, as it will received funding from the NHS if it does not make profit. This link with the NHS also prevented them from introducing these technologies.
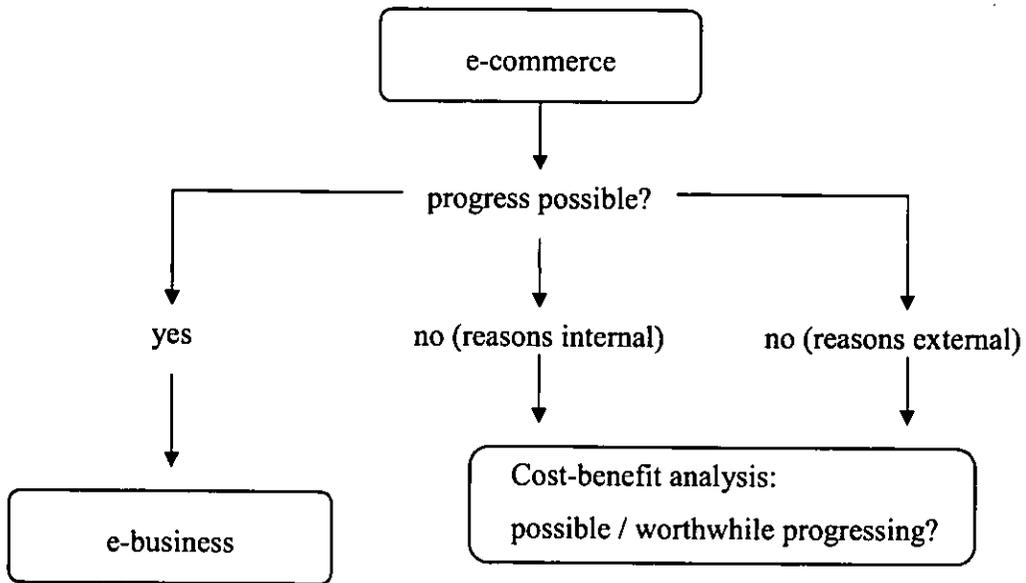
Progressing from high levels of e-adoption

The first steps on the e-adoption ladder did not seem to cause problems for the interviewed companies once e-business technologies have been introduced, so the transition from the e-mail stage to the web site stage of the e-adoption ladder did not provide insuperable obstacles for the companies interviewed and should not do so for other companies because they are now already familiar with simple e-business technologies.

The next step, moving from already high levels of e-adoption to even higher levels, e.g. from the web site stage to the e-commerce stage, is usually more work intensive, especially when selling products and services online, as the e-commerce systems need to be kept up to date which usually requires that the company creates mechanisms or procedures to regularly update databases, e.g. for stock levels or prices. UK enterprises generally seem to be doing well in this area, as more UK enterprises have purchased over the Internet or other networks than the EU25 average[1] (Demunter 2005, p.6). UK enterprises were in fact leading when it comes to purchasing online with more UK enterprises having purchased over the Internet or via other networks than enterprises from any other country included in the Eurostats statistic (Demunter 2005, p.6).

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[1] before the 2007 enlargement, i.e. without Bulgaria and Romania and excluding France, Italy and Malta as well as micro-sized enterprises

The next step, being on the e-business stage of the e-adoption ladder, can be very rewarding for companies. While companies at the e-commerce stage buy or sell online but have not integrated these systems with their supply chain, there is the danger of keeping redundant data in different, not integrated systems. Not only is synchronising the data between the e-commerce system and the supply chain a time and work intensive task, there is also the possibility of the data becoming inconsistent in the different systems. When moving onto the e-business stage the need for keeping the e-commerce systems up to date with the "reality" of the company is eliminated, but tying in the e-business systems with existing legacy systems can be very difficult and will require expert knowledge most likely not found in companies who are not "born on the net" but who started as a traditional company and moved towards e-business later. If companies are not able to integrate their systems they cannot move up to the e-business stage. In this case the reasons for not being able to progress are internal (Figure 14), which makes these reasons potentially easier to overcome than external reasons. Whether the benefits gained from being on the e-business stage justifies the cost, in this case the tangible cost of paying for the integration of the systems by hiring a company or in some cases possibly by training existing IT staff should however depend on the outcome of the following cost-benefit analysis.

Figure 14 Progress from e-commerce to e-business

Other reasons for not being able to move up to the e-business stage are external influences (Figure 14), which are more difficult to overcome as they might be outside of the companies' influence. If companies deal with business partners who do not have e-business capabilities they often end up in a situation similar to SDS's, a company that used an EDI based system in the past, but reverted back to more traditional ways of exchanging data. The managing director of SDS described it this way:

> "we do repeat businesses via our computer system which tells us how much we got in stock and it has minimum reorder levels and triggers off automatic orders which are then printed out at the moment and send to the supplier via fax machine and we're going to upgrade that so that they automatically get e-mailed out." (SDS)

Even after upgrading their systems to get the orders e-mailed, their systems are still not directly connected to the systems of the business partners, as orders will have to be dealt with manually by the business partner, which will most likely result in a less than optimal solution with information sent back from the business partner to the company

252

being delayed, e.g. the acknowledgement of the order or a warning that the order can not be fulfilled in the required time frame.

The concept of the transformed organisation which represents the highest stage of the e-adoption ladder is not defined as well as the other stages, like the web site or e-commerce stage. Most companies have not yet reached the e-business stage and no company in this study was a "transformed organisation". The progression from very high levels of the e-adoption ladder to the highest level is therefore not discussed because there is no information to base this discussion on and because currently becoming a transformed organisation can be useful for a large dot com company, but does not seem realistic for a SME.

Cost-benefit analysis for new e-business opportunities

When implementing new technologies to seize e-business opportunities, the opportunities should be assessed in terms of cost and benefit as would normal business opportunities. Turban et al. (2008, p. 686) present a model for e-commerce and IT project justification that can be useful for decision makers when assessing potential cost and benefits of the introduction of new e-business technologies (Figure 15). When progressing from lower levels of e-adoption the cost-benefit analysis should often result in relatively high benefits and low costs, especially financial cost. As companies progress along the e-adoption ladder the costs will most likely get higher, as the e-business technologies to be introduced get more complex, but benefits should also increase enormously, even though the increased benefits are often intangible and might therefore not be as obvious as the increased cost. There will be companies where further

253

progression on the e-adoption ladder is not advantageous, as long as their business environment does not change. Examples have been presented previously, and the interviews found that reasons are usually external, often customer driven, as in the case of EDM were customers do not want to order online, which limits possible progression to procurement, or in the case of RNH, where personal trust is an extremely important part of customer relationship and where it is felt that e-adoption would not improve customer relationship or business opportunities enough and progression is therefore limited to procurement or government-to-business interaction.

Strategic Considerations

Strat. Objectives for the Investment in IT

Support for Corporate Strategy

Market Trends

Top Management Support

Competitive Performance Objectives

Long-Term Costs and Benefits

Government Regulations

Tactical Considerations

Performance Indicators

Generating Data

Evaluation Methods

Security

Involvement of Senior Managers

Available Budget

Competing Projects

Operational Considerations

Existing IT Systems

Data Sources and Migration

Software Needed and Available

Users' Perception

Servers Needed and Available

System Integration

Existing Operations System

Staff and Skills Available

Intangibles

Competitive Advantage

Services to Society

Job Enrichment

Employee Satisfaction

Quality Improvement

Improve Customer Relationship

Enhance Confidence

Future Business

Risk of Not Investing in IT

Teamwork

Good Image

Government regulation

Tangibles

Financial

Budgets

Priority of Investment

ROI Justification

Product cost

Market Alternative Technology

Profit Level

Revenue Model and Projection

Nonfinancial

Lead-time

Inventory

Labour Absence

Defective Rate of Products

Set-up Time

Justification of Investment in EC and IT Projects

Figure 15 Turban at al.'s Model for IT Project Justification

255

Risk analysis, assessment and management for e-business

Like normal business activities, e-business activities, like the introduction of new e-business technologies, contain risks that should be assessed. After risks are identified they are assessed and when the risk/opportunity ratio is not favourable the risks turn into inhibitors. If this ratio changes, for example through bigger opportunities or through lower risks an initiative can be considered again for introduction.

Deise et al. (2000, p. 162). identify 15 different e-business risks, namely

- strategic direction
- competitive environment
- dependence on others
- security
- reputation
- culture
- technology
- governance
- project management
- operations
- legal and regulatory
- human resources
- business process controls
- tax
- currency

These 15 e-business risks can be positioned in relation to strategic risk, operational risk and financial risk (Deise et al. 2000, p. 163), as shown in Figure 16.

Figure 16 Deise et al.'s e-business Risks View #1

Upton identifies seven sources of risk, three from outside the organisation and four from within the organisation as shown in Table 58 (Upton 2001, p. 1).

Inside risk source	Outside risk sources
• people	• criminals
• processes	• commercial environment
• technology	• legal systems
• business strategy	

Table 58 Upton's sources of risk

When trying to relate the inhibitors discovered during the interview stage to the E-Business Risk View (Figure 16) from Deise et al. (Deise et al. 2000, p. 163) it becomes apparent, that the inhibitors usually stem from e-business risks positioned in the operational risk category, while the e-business risks more related to strategic risk and

257

financial risk do not seem to turn into inhibitors. This could possibly indicate that SMEs are not aware of financial or strategic risks, but more likely it shows that financial and strategic risks are assessed but the risk/opportunity ratio is seen as favourable and these risks do therefore not turn into inhibitors. The assessment of the risk/opportunity ratio of e-business risks and its consequences for e-business inhibitors is a very interesting topic, but as it is only a very small part of the overall e-business strategy it was not investigated further, but lends itself for possible future work in this area.

When looking at Upton's sources of risk (Upton 2001), common inhibitors seem to originate from inside risk sources, with the only important inhibitor originating from outside sources being the commercial environment. The commercial environment can turn into an inhibitor because of low opportunities offered, especially when SMEs work with big business partners who do not want to take up e-commerce technologies.

Turban et al. writes that "risk management involves taking steps to reduce the probability that the threat [posed by risk] will occur, minimizing the consequences if it occurs anyway, or both" (Turban et al. 2008, p. 656), but the first decision that has to be made by SMEs is whether the offered opportunities are big enough to consider taking any risks. The awareness that inhibitors in SMEs seem to concentrate around operational risks and internal risk sources can provide a guideline for SMEs to know where to look for risks, when an e-business strategy has to be developed or modified in a short time.

Business plan for e-business

According to Business Link (Business Link 2009) a business plan should contain

- an executive summary

- a short description of the business opportunity

- the marketing and sales strategy

- information about the management team and personnel

- information about the operations of the business

- a financial forecast

E-business is not explicitly mentioned in the advice given to UK companies, and it could be argued that today e-business is such an integral part of business that including it in a business plan should be taken for granted, but the interviews showed that only e-business strategy leaders tend to include e-business strategy in their business plan, while SMEs from other groups of the taxonomy do not include e-business strategy or do not have a formal business plan. When asked whether their e-business strategy is discussed together with their normal strategy SLS, an e-business strategy leader, answered "yes, it would be part and parcel of our business plan, definitely" (SLS), before the interviewee continued to explain that their

> "business plan is revised twice a year, it's looked at the end of the last financial year, it's looked at in March, it's looked at again in September, but at monthly formal partners meetings we will discuss issues arising on the business plan and we have short term twelve month goals and longer term goals over three years and within that would be anything that's relating to IT, so things are constantly being pushed forward, not necessarily reviewed formally, but looked at at least monthly where we're looking at what needs doing. " (SLS).

CAA, another e-business strategy leader also includes e-business strategy in the business plan, but it is not as tied into the business plan as it is in SLS. When asked how formal their business plan is and how often it is revised CAA answered

> "The directors meet regularly anyway, so it'll come up as an issue. I mean there's a five year plan and a one year plan, which is more specific on what we're gonna do for the first of that five years and they will measure them and they do meet very regularly to discuss how the company's doing, so sure that comes up." (CAA).

The e-business strategy is part of the business plan, but CAA are chartered accountants and business advisors and responded that it will not be the main focus as selling products online is not easy in their industry so plans for improving services will include e-business but focus on "most ways other than e-business" (CAA).

Advice is available to companies on how to write a business plan, provided by organisations funded by the government, like Business Link (Business Link 2009), but also from banks and other organisations. E-business is unfortunately often neglected in this context. When preparing a business plan the SMEs should include the outcomes from the strategy initiation and from the strategy formulation phases for e-business, something that in this study is currently only done by the e-business strategy leaders.

7.4 Strategy Implementation

7.4.1 Traditional Strategy Implementation

The strategy implementation phase is used to implement the strategic path that was decided during the strategy formulation phase. Turban et al. state that the strategy

260

implementation should include the following specific activities and outcomes (Turban et al. 2008, p. 643) .

- Project planning

- Resource allocation

- Project management

The aims that should be reached through the strategy can be implemented by splitting them into different parts that are realised using project planning.

Resource allocation is described by Turban et al. as the allocation of organisational resources that can be human, financial, technological, managerial or knowledge based (Turban et al. 2008, p. 643).

Project management is concerned with all the steps necessary to implement the project.

7.4.2 E-business Strategy Implementation

Recent research in the area of e-business implementation emphasises the importance of critical success factors in the context of e-business strategy implementation (Alwabel & Zairi 2005; Chuang & Shaw 2005; Deželak, Sternad, & Bobek 2006; Zhao, Zhu, & Wang 2008) or for the adoption of e-business in general (Jeffcoate, Chappell, & Feindt 2002; Li & Li 2005; Shah & Dawson 2002; Tsao, Lin, & Lin 2004). There are common critical success factors that seem to apply to the context of e-business strategy implementation independent of the type of company, even though the critical success factors found or discussed in different journals vary slightly as do the types of

companies examined. Critical success factors mention in the literature that were also found in the qualitative stage of this study will be presented with regards to the e-adoption strategy classification. If they have already been covered in previous contexts the description of the critical success factors will refer to previous discussions and explanations of these factors in this study and will not repeat the discussions again.

Partner e-readiness

Partner e-readiness has been discussed previously on page 252 in the context of progressing on the e-adoption ladder from already high levels of e-adoption and on page 238 in the context of value proposition. Zhao, Zhu, & Wang discuss partner e-readiness as critical success factor for e-business implementation and split it into the areas of suppliers e-readiness, retailers e-readiness and customers e-readiness (Zhao, Zhu, & Wang 2008, p. 2). Their study on large Chinese companies discovered that partner e-readiness is very important in the context of CRM, but it is only of smaller importance in the context of e-procurement and e-ordering, while the qualitative stage of this study showed that the focus for partner e-readiness in UK SMEs shifts away from CRM, possibly because of the dependence of SMEs on larger business partners, a situation encountered mainly by e-adoption leaders and formal strategy leaders where there is external pressure from business partners not to use e-business technologies, a situation that is the opposite to the situation described by Mehrtens, Cragg and Mills (2001, p. 169), who portray a situation where SMEs are forced to adopt e-business.

Commitment

Commitment, a critical success factor described by Jeffcoate, Chappell and Feindt in their article on best practice in SME adoption of e-commerce as "a strong motivation for using the Internet and the will to innovate" (Jeffcoate, Chappell, & Feindt 2002, p. 129), is related to the concept of the Information Technology Champions as described by Beath (Beath 1991, p. 355) and covered in great detail in chapter 6.4 in the context of technology as a driver for e-business, as IT champions usually provide strong motivation for using the Internet. In their comparative analysis of e-business implementation critical success factors, Deželak, Sternad and Bobek write about the project champion which has been covered in published articles about e-business implementation critical success factors (Deželak, Sternad, & Bobek 2006, p. 171) and which can be congruent with the IT champion in the case of e-business implementation. Commitment as a critical success factor is present in many groups of the e-adoption strategy classification, but is particularly strong for e-adoption leaders.

Integration

Zhao, Zhu and Wang investigated Information Systems integration as a critical success factor in their study (Zhao, Zhu, & Wang 2008, p. 2). Jeffcoate, Chappell and Feindt describe the integration critical success factor as "the provision of links between underlying IT systems in support of partnership and process improvement" (Jeffcoate, Chappell, & Feindt 2002, p. 129). Companies in this study with strong integration when it comes to their e-business systems or Information Systems were usually either e-adoption leaders or e-business strategy leaders: HOT, PDC, PBM and HCS all managed

to integrate their IS systems which resulted in them gaining a competitive advantage in their industry.

7.5 Strategy Assessment

7.5.1 Traditional Strategy Assessment

Strategy assessment should be a continuous process where the strategies used by the companies are assessed and modified if necessary. Not assessing the strategies continuously but in long intervals brings the danger of steering in the wrong direction for too long, moving away from a desirable position and wasting resources and time while moving in the wrong direction.

As the strategic goals are reassessed, the previous stages, namely strategy initiation, strategy formulation and strategy implementation can be revisited to rephrase the strategies as necessary.

Turban, King and Lang write that the use of metrics helps when reassessing the strategies before restarting the strategic planning process again, as shown in Figure 7 (Turban, King, & Lang 2009, p. 523).

7.5.2 Strategy Assessment for e-business

One of the problems when assessing strategies and also the e-business performance is that not all metrics are tangible and putting a value on intangible metrics or even measuring them can be therefore very difficult. Recently published literature (Bremser & Chung 2005; Cheng & Cheng 2005; Rayport & Jaworski 2004; Turban, King, & Lang 2009) uses metrics to help measuring e-business performance, but often in different ways as shown in the following section.

Aimed more at larger companies Bremser and Chung address the problem of performance measurement in the e-business environment by expanding the traditional Balanced Scorecard to take "the 'click' side of business in addition to 'bricks' due to e-business" (Bremser & Chung 2005, p. 401) into account. When looking at metrics for online firms, Rayport and Jaworski address the limitations of the Balanced Scorecard by using their performance dashboard to reflect the health of a business and to drive the necessary metrics (Rayport & Jaworski 2004, p. 279). Their metrics include

- Market opportunity metrics
- Business model metrics
- Marketing and branding metrics
- Implementation metrics
- Customer metrics

Turban, King and Lang use metrics for electronic commerce justification and split their electronic commerce metrics into four areas depending on the user of electronic

commerce and list tangible and intangible metrics separately as shown in Table 59 (Turban, King, & Lang 2009, p. 531).

EC User	Tangible metrics	Intangible metrics
Buyer (B2C)	• Cost/price of the product • Time in executing the transaction • Number of available alternatives	• Ease of use of EC • Convenience in purchasing • Information availability • Reliability of the transaction • Privacy of personal data
Seller (B2C)	• Profit per customer • Conversion rate of visitors • Customer retention rate • Inventory costs • Profit per item sold • Market share	• Customer satisfaction • Customer loyalty • Transaction security
Net-enhanced organisation (B2B)	• From design to market (time) • Cash-to-cash cycle • Percentage of orders delivered on time or early • Profit per item sold	• Flexibility in changing purchase orders • Ability to sustain unplanned production increase • Risk reduction • Improved quality of products / services
Government (G2C)	• Reduction in cost of transactions • Reduction in licensing fees • Increase in participation in government programs • Lower tax rates	• Citizen satisfaction • Reelection of candidates • Choice of interacting with elected officials • Promoting democratic principles • Disseminating more information quickly

Table 59 Turban, King and Lang's sample EC metrics for various entities of users

266

Measuring the success of e-business and its strategies is a difficult task as many advantages of e-business and of introducing a strategy are difficult to measure. It seems likely that SMEs will find their own ways of strategy assessment that fit in with their priorities and needs. The outcome of the strategy assessment can then be fed back into the strategy initiation phase.

7.6 Summary

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This chapter took the findings from the quantitative stage of this study and from the qualitative stage of this study and put them in a form that can be used by SMEs. This was done by expanding the four stages of the strategy planning process, namely strategy initiation, strategy formulation, strategy implementation and strategy assessment, and adding an e-business component to these stages.

Contributions to the strategy initiation phase include a strategy and e-adoption classification that can be used by SMEs to find out their position in relation to e-adoption and strategy compared to other SMEs.

The strategy formulation phase included the suggestion of a path of progression based on the SMEs current position as determined in the previous phase and relates this progression to SMEs from the interview stage.

The strategy implementation phase relates critical success factors found in the literature to those found in the interview stage.

Based on academic literature the strategy assessment phase then shows how SMEs can measure their e-business performance.

8 Conclusion

8.1 Discussion of research questions

The findings from this study will be related to the research questions asked at the beginning of this study, namely the following four questions:

1. What is the current situation of SMEs in relation to their e-business adoption and their e-business strategies?

2. Are there different types of SMEs based on their e-adoption and strategies?

3. How do the different attitudes of SMEs towards e-adoption and strategies manifest themselves?

4. How can SMEs include e-business in their strategy development process in a "quick and easy" way?

Question 1 was mainly addressed in the literature review, but the current situation of SMEs in relation to their e-business adoption and their e-business strategies was also examined in the quantitative and qualitative studies conducted. Before the current situation was described SMEs were first defined for use in this study as different research is often using different definitions for SMEs or the definitions for micro, small and medium sized enterprises are not congruent in different studies. E-business and its adoption by SMEs and the associated problems were then introduced, followed by an explanation of the use of strategy in the context of business and strategies for e-business as used by SMEs. E-business surveys were also investigated as part of the literature

review, but the investigation of these surveys is of greater importance for the work leading to the second research question.

To address the second research question a survey was conducted after starting to address this research question by investigating similar studies in this area as part of the literature review. After completing the data collection of this quantitative survey the data was then analysed using multivariate data analysis. This analysis led to the identification of five cluster groups that described distinct groups of SMEs in relation to their attitudes towards e-adoption, business strategies and e-business strategies. The qualitative stage of this research helped to deepen the understanding of the different types and did therefore also contribute to addressing this research question.

The third research question was then attended to by examining the groups identified as part of the cluster analysis. As micro, small and medium-sized companies can be quite different in terms of business structure and hierarchy this was done taken not only the group membership but also the size of the SMEs into account. The examination took the form of semi-structured interviews that were then transcribed and analysed.

To answer the final research question the findings from the study so far were combined with the strategy planning process. The outcome could be used by SMEs to help them when developing a strategy for e-business.

The methodology used for this research has contributed to the findings in several ways. The sequential explanatory approach, described in chapter 3.3.2, helped to discover different types of SMEs through the quantitative stage, which made the taxonomy of e-adoption strategies in SMEs possible, and went on to explore the gestalt of the different types of SMEs through the qualitative stage, which finally led to the rapid e-business

270

strategy development model. The methodology, including sample size considerations and multivariate data analysis also helped to make the findings traceable and academically valid.

8.2 Limitations of research

It will be shown that there are several limitations to this research, originating from the quantitative stage, the qualitative stage and from the combination of the outcomes from these stages with the strategy planning process.

When looking at the quantitative stage from a statistical point of view it has to be said that it cannot be proven that the sampling frame chosen is representative of the population. This is unfortunately unavoidable as there is no single correct source of company data that contains all elements of the population as shown in chapter 3.4 and chapter 4.2. This is also obvious when comparing findings from this study as presented in Table 19 and Table 27 with the latest figures from the BERR (Department for Business Enterprise & Regulatory Reform 2008), which shows that micro sized enterprises were underrepresented in this study. There is however no evidence that this would have influenced the outcome of the cluster analysis, and keeping in mind that there is no sampling frame available that is representative for SMEs in the UK the study is still a valuable contribution to knowledge

The research does not try to model all processes necessary in an enterprise to make use of this model. Instead this research concentrated on developing a model to help SMEs plan their strategies in the area of e-business. Implementing such a model might have

implications for all areas of an enterprise, e.g. the supply chain, that cannot all be taken into account.

As the strategic planning process also contains so many components it is not possible to explore all of these components in great depth. It is however felt that providing guidelines for the whole strategic planning process with less depth is more useful for SMEs than providing in depth advice for one specific part, e.g. forecasting, which could be very valuable for certain types of SMEs while it might be less valuable for other SMEs.

Depending on their size and the industry they are in, SMEs are in very different situations. The outcome of the cluster analysis has shown that their usage of strategies and their level of e-adoption will also make a big difference when it comes to their e-business strategies. A micro-sized company in the catering industry with low e-adoption will have therefore very different needs when it comes to their e-business strategy than a medium-size manufacturer with heavy usage of B2C technologies. The strategic model presented in chapter 7 will have to be adapted by SMEs to fit their specific needs.

8.3 Contributions

This thesis contributes predominantly to knowledge in the area of strategic management and information systems, specifically e-business strategies, although it also contributes to policy and to knowledge in the area of mixed-mode surveys. The contributions include:

Provision of a theoretical framework for conducting mixed-mode surveys using mail and web questionnaires

A theoretical framework has been provided in this thesis that can be used by researchers to conduct a mixed-mode survey as an alternative to a paper-only survey. This brings potential benefits in the form of an increased response rate and the easy transfer of electronically collected data into statistical software packages that outweigh the disadvantages caused by additional work. Technological aspects, security concerns and measures taken to increase the convenience for the users have been described in chapter 4.4. This mixed-mode methodology can be replicated by other researchers to benefit from the advantages outlined above.

The creation of a classification of e-adoption, business strategy and e-business strategy.

The theoretical framework produced in this thesis proposed a taxonomic classification of SMEs based on the dimensions of e-adoption, business strategy and e-business strategy and resulted in five groups, namely e-business strategy leaders, old fashioned . SMEs, blind e-business users, e-adoption leaders and formal strategy leaders. The existence of the taxonomic groups, discovered using quantitative, numerical methods for examining multivariate data, was confirmed using interviews as a method of qualitative research. An additional contribution is the fact that the theoretical framework for taxonomic classification produced can be used in further research as the basis for investigating the distribution of SME clusters.

<u>Strategy development for SMEs through taxonomic groups of e-adoption, business</u> <u>strategy and e-business strategy as used by SMEs</u>

Relating the e-adoption, business strategy and e-business strategy as used by SMEs to strategy initiation, strategy formulation, strategy implementation, and strategy assessment provides a contribution to the literature in this area. The knowledge gained from the different taxonomic groups was then used to provide guidance, previously not available in this form, to SMEs in the areas of strategy initiation and strategy formulation, which also influence strategy implementation and strategy assessment. Given the lack of resources at the disposal of many SMEs to undertake strategic analysis and the fast paced environment of e-business, this model allows small and medium enterprises to carry out suitable strategic analysis rapidly before undertaking an investment in e-business. Being based on Turban's Strategic Planning Process (Turban et al. 2008, p. 641) it can be used for the whole strategic planning cycle and adds an e-business dimension suitable for SMEs. Other models published in recent years and looking at e-business strategies and SMEs include Levy and Powell's revised focus-dominance model (Levy & Powell 2005, p. 376) and Levy and Powell's transporter model (Levy & Powell 2003). While the revised focus-dominance model helps to identify competitive scenarios taking into account the state of use of Internet technologies, the transporter model helps to group SMEs depending on their attitudes to business growth and the business value of the Internet. Both models can help SMEs by laying out a rough path to follow when it comes to e-business. A recent model from this field is Parker and Castleman's descriptive model of influences on small firm e-business adoption decisions (Parker & Castleman 2009, p. 169), arising from their previous work (Parker & Castleman 2007), which is useful to help SMEs to understand internal and external influences in the context of e-business. Other models like Joyce and Winch's

274

framework (Joyce & Winch 2005) provide an entrepreneurial top-down perspective and a bottom-up technological capability, view which help companies to identify needs and opportunities as well as strengths, capabilities and resources. An advantage of the model presented in this research that helps SME to carry out suitable strategic analysis rapidly before undertaking an investment in e-business is that it provides guidance for the different stages of the whole strategy planning process, something not available in these other models that appeared in the literature in the past years.

Contribution to policy

Despite the limitations the findings from this research could prove to be useful for policymakers. The taxonomic classification of e-adoption, business strategy and e-business strategy can be used to identify SMEs with specific needs and to offer tailored advice and guidance to SMEs depending on the affiliation with specific cluster groups. Furthermore SMEs could benefit if the strategic model presented in chapter 7 is used to facilitate the strategic development of SMEs. This could take the form of policymakers raising awareness of the different types of SMEs in relation to their e-adoption, use of business and e-business and could lead to assisting the e-business engagement of SMES and the progression towards becoming an e-business strategy leader to enable a more efficient and effective use of e-business.

Contribution to practice

This thesis contributes to practice by providing a "quick and easy" guide for SMEs in the form of a strategic model, based on Turban's Strategy Planning Process (Turban et al. 2008), but with the strategy initiation, strategy formulation, strategy implementation

and strategy assessment phase expanded by an e-business component (see Figure 8). This can be used by SMEs to add e-business strategies to their strategic planning. The "quick and easy" guide can however only support the abstract, high level planning of e-business strategies, because e-business strategies on a lower level would be very dependant on the SME's industry sector and its specific environment and goals. This can be seen in examples given throughout chapter 6, as in the case of FCR, a Fish'n'Chips restaurant, and PSF, a producer of synthetic fibres, two companies in very different industry sectors and with very specific environments and goals.

The knowledge gained as part of this research was disseminated to the academic community through presentations, conference papers and journal papers. Presentations given at PhD workshops and research seminars (Meckel 2002a; Meckel 2002b; Meckel 2003a; Meckel 2003b) helped by providing useful feedback that could be used for improvement. Conference papers and the corresponding presentations (Meckel & Walters 2002; Meckel & Walters 2003; Meckel, Walters, & Baugh 2004) were also very useful as other researchers with similar areas of interest gave valuable input. Preparing and submitting journal papers (Meckel et al. 2004; Meckel, Walters, & Baugh 2005) was particularly useful as the comments from the reviewers of the papers helped to create a more focussed research and also because the publication helps the contribution to knowledge by disseminating the research to the academic audience and shows through other authors referencing these two papers that the research is seen as useful by the academic community.

8.4 Recommendations for further research

The methodology used to create the classification of e-adoption, business strategy and e-business strategy is not limited by geography or industry sector. The research could therefore be used to classify SMEs from other areas of the UK or from other countries and it could also be used to compare the situation of SMEs in relation to the e-adoption and strategies in different industry sectors. The fact that e-business strategy leaders often came from highly regulated industry sectors suggests that comparing the distribution of the five classification groups within different industry sectors could provide a valuable insight into e-adoption and strategy drivers within different industries.

The strategic model provided in this research was intended not only to be a contribution to theory, but also to praxis as a useful tool for SMEs when developing e-business strategies. The ability of the strategic model to contribute to praxis depends however on further research investigating whether this model is seen as "quick and easy" enough to be used by SMEs currently neglecting strategies and whether the use of the model will have a positive impact on these SMEs by promoting the use of e-business and strategies.

The link between the existence of an IT champion and the use of e-business strategies, as mentioned in chapter 6.4, also lends itself as a recommendation for further research as the existence of an IT champion seems to not only drive e-adoption forward, but also e-business strategy.

The assessment of the risk/opportunity ratio of e-business risks and its consequences for e-business inhibitors as described in chapter 7.3.2 is also very interesting topic that has not been examined further in this research as it is only a very small part of the overall e-

business strategy. Further research in this area could however benefit both theory and practice.

A final recommendation for future research would be the further investigation of parallel mixed-mode questionnaires using the theoretical framework for web questionnaires as described in this study. This could be done by using this theoretical framework in studies from different academic areas for the data collection. The theoretical framework presented addressed known issues of mixed-mode surveys and should therefore be able to contribute to studies by increasing response rate, speed and convenience for the researcher.

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Questionnaire

Please fill in this questionnaire. If you have any problems with any of the questions we will be happy to assist you. You can contact us at ....

Please write down the name and the job title of person(s) who filled out this questionnaire.

_____

_____

_____

_____

Section A - General Questions

The answers to the questions in this section will be used to classify your enterprise according to European and British definitions, namely to find out
- whether your enterprise is an SME
- what kind of SME your enterprise is
- the economic activity in which your enterprise is engaged

A1 Number of Employees	Please tick the most suitable box:
How many persons are employed in your enterprise?	☐ 1 - 3 ☐ 4 - 7 ☐ 8 - 10 ☐ 11 - 23 ☐ 24 - 37 ☐ 38 - 50 ☐ 51 - 116 ☐ 117 - 183 ☐ 184 - 250 ☐ more than 250
A2 Turnover	**Please tick the most suitable box:**
How big(?) is the annual turnover of your enterprise?	☐ less than £ 4.4 million ☐ between £ 4.4 million and £ 25 million ☐ more than £ 25 million
A3 Legal Form	**Please tick the most suitable box:**
What is the legal form of your enterprise?	☐ Sole Trader ☐ Partnership ☐ Private Unlimited ☐ Private Ltd Co (LTD) ☐ Public Ltd Co (PLC) ☐ none of the above Please write down the legal form of your enterprise if it is not listed:

APPENDIX I Pilot questionnaire

A4 UK SIC(92) Classification   **Please fill your SIC Code in**

How is your enterprise classified
according to the UK SIC(92) ?

SIC Code: _____

Explanation:
UK SIC stands for UK Standard Industrial
Classification of Economic Activities. It is sufficient
to provide your Section, you are however
welcomed to provide Your Subsection, Division,
etc. as well.
You can find a summary of the UK SIC(92)
sections and subsection in the Appendix on page
xx)

Examples:
H (Only Section)
CB (Section, Subsection)
17.40/1 (Division, Group, Class, Subclass)

A5 Location   **Please fill the number of locations in**

How many locations has your enterprise? Number of locations: _____

Section B – E-Business

The answers to the questions in this section will be used to find out more about your
current or future E-Business activity.

Technical aspect

B1-1 Number of PCs   **Please fill the number of PCs in**

How many PCs are approximately in your
enterprise?

Approximately ___ PCs

A PC here is a Personal Computer. Examples for
PCs are IBM compatible PCs with e.g. Windows
or Linux as its Operating Systems as well as
Computers from Apple with Mac OS as its
Operating System.

If there are no PCs in your enterprise please fill in
"0" and continue with question xxx
(Do you plan to buy PCs)

B1-2 Other Computers   **Please fill the type and number of other computers in**

How many and what other computers are
used in your enterprise?

_____

_____

Examples of other kinds of computers are e.g. a
minicomputer or a mainframe. Normally
minicomputers or mainframes have at least the
size of a wardrobe.

If there are no other computers in your enterprise
please fill in "n/a"

B1-3 Daily use   **Please tick the most suitable box**

What percentage of your enterprise's
employees are making daily use of PCs
at work?

☐ 0%
☐ 1% - 79%
☐ 80% - 100%

(% chosen to compare easily with UK online for business' international benchmark 2000)

APPENDIX I Pilot questionnaire

B1-4 own Network   Please tick the most suitable box.

Is your enterprise using its own LAN
(Local Area Network) or Intranet?

Explanation:
Your enterprise has a LAN if its PCs are
connected through a network to share company
information or computing resources among
employees (e.g. save documents in a central
place or share printers)
Your enterprise has an Intranet with web
technology is used in conjunction with a LAN to
enable staff to communicate with each other, to
access information etc. (e.g. internal e-mails,
internal web-pages to access information)

☐ None
☐ LAN
☐ Intranet

B1-5 Internet Access, How   Please tick the most suitable box.

☐ No Internet Access
☐ Manual Dial-up (Modem or ISDN)
☐ Always connected (Modem or ISDN)
☐ xDSL / Cable Modem (up to 1 Mbit/s)
☐ TI / xDSL / Cable Modem, etc.
                    (more than 1 Mbit/s)

How does the enterprise access the
Internet?

Explanation:
Dial-up connection means that the PC or the
network gets manually connected to the Internet
when needed (e.g. the ISP is dialled when e-mails
should be received)
Always connected means that the PC or the
network is always connected or gets automatically
connected to the Internet when needed, e.g. by
using a flatrate or by using a router that is
automatically connecting the network to the
Internet when required

Please continue with Question B1-9 if your enterprise has no Internet access.

B1-6 Internet Access, When   Please tick the most suitable box.

When did your enterprise connect to the
Internet?

☐ less than 1 year ago
☐ between 1 and 2 years ago
☐ between 3 and 4 years ago
☐ more than 4 years ago

B1-7 E-Mail Employees   Please tick the most suitable box.

Which employees of your enterprise have
access to an own e-mail account at work?

☐ every employee
☐ every employee working in
administration
☐ only key employees
☐ only management

B1-8 Internet Employees	**Please tick the most suitable box.**
Which employees of your enterprise have access to the World Wide Web at work?	☐ every employee ☐ every employee working in administration ☐ only key employees ☐ only management

B1-9 Remote Access	**Please tick the most suitable box**
Which employees of your enterprise have remote access to your computer system? e.g. from Home, Access from another location of your enterprise is not seen as remote access	☐ every employee ☐ every employee working in administration ☐ only key employees ☐ only management

B1-10 Web presence, available	**Please tick the most suitable box**
Does your enterprise have a web presence?	☐ Yes ☐ No, but we currently set up one. ☐ No, but we plan to set up one. ☐ No, and we don't intend to set up one. ☐ No, we haven't thought about this yet.

Please continue with Question B1-16 if your enterprise has no web presence yet and is not intending to set one up.

B1-11 Web presence, creation	**Please tick the most suitable box**
Who created / will create your web presence?	☐ Dedicated staff from our enterprise. ☐ Existing staff that was additionally assigned to this task with no previous web knowledge ☐ Existing staff that was additionally assigned to this task with previous web knowledge ☐ Existing staff from a related department (e.g. PR, advertising) ☐ External company ☐ Partnership

B1-12 Web presence, update	**Please tick the most suitable box**
How often is the information on your web presence updated?	☐ More than 5 times a week ☐ Less than 5 times a week ☐ More than 5 times a month ☐ Less than 5 times a month ☐ More than 5 times a year ☐ Less than 5 times a year

APPENDIX I Pilot questionnaire

B1-13 Web presence, dynamic

Is your web presence providing dynamic content?

Please tick the most suitable box.

☐ No
☐ Yes, dynamic data for web presence only
☐ Yes, dynamic data also used in other areas of enterprise

B1-14 Web presence, content

What do you provide on your web presence?

Please tick all suitable boxes.

☐ Information about products and services
☐ Means for customers to order products or services
☐ Information about the enterprise itself
☐
☐

B1-15 Web presence, performance(?)

Do you measure the performance(?) of your web presence?

Please tick the most suitable box.

☐ No
☐ We record the hits or visitors.
☐ We record the logfiles.
☐ We analyse the recorded information.

B1-16 E-Business Adoption

How would the enterprise be classified in the e-adoption ladder used by UK online for business?

Please tick all suitable boxes.

☐ 1. e-mail
☐ 2. website
☐ 3. e-commerce
☐ 4. e-business
☐ 5. transformed organisation

Explanation:
1. e-mail : your enterprise is using e-mails
2. website: your enterprise has it's own website
3. e-commerce: your enterprise is ordering and / or paying online
4. e-business: your enterprise integrated the supply chain
5. transformed organisation: open systems information for customers, suppliers and partners

B1-17 EDI

Is your enterprise using EDI (Electronic Data Interchange)?

Please tick the most suitable box.

☐ Yes
☐ No

Explanation: xxx

Business aspect

B2-1 Customers	Please tick all suitable boxes.
Where are the main customers of your enterprise?	☐ Local ☐ Regional ☐ National ☐ International

B2-2 Suppliers	Please tick all suitable boxes.
Where are the main suppliers of your enterprise?	☐ Local ☐ Regional ☐ National ☐ International

B2-3 Orders from Customers	Please tick all suitable boxes.
How is your enterprise taking orders from customers?	☐ Directly (Talk to customers) ☐ Telephone ☐ Post ☐ Fax ☐ E-Mail ☐ Internet (but not E-Mail) ☐ EDI ☐ Other (Please specify.....................)

B2-4 Ordering from Suppliers	Please tick all suitable boxes.
How is your enterprise ordering from suppliers?	☐ Directly (Talk to customers) ☐ Telephone ☐ Post ☐ Fax ☐ E-Mail ☐ Internet (but not E-Mail) ☐ EDI ☐ Other (Please specify.....................)

Section C – Strategy

The answers to the questions in this section will be used to gather information about your use of strategy in general and about your use of strategy for e-business.

General aspect

C1-1 Strategy, General	Please tick the most suitable box.
Does your enterprise have a strategy? N.B. This question is about your strategy in general, not about your E-Business strategy	☐ No ☐ Yes, verbally defined ☐ Yes, written down

C1-2 Strategic Models

Please tick all suitable boxes.

Which strategic models is your enterprise currently using or planning to use in the near future?

N.B. This question is about your strategic models in general, not about your strategic models for e-business.

☐ Five Forces
☐ SWOT
☐ PEST / TEMPLES
☐ Balanced Scorecard
☐ Business Excellence Model / EFQM Excellence Model
☐
☐ Product Portfolio Analysis (e.g. Boston Matrix)
☐
☐ traditional / informal
☐ none
☐ Other (Please specify.....................)

E-Business aspect

C2-1 Strategy E-Business

Does your enterprise have an E-Business strategy?

N.B. This question is about your E-Business strategy in general, not about your general strategy.

Please tick the most suitable box.

☐ No
☐ Yes, verbally defined
☐ Yes, written down

C2-2 Decision making process

Describe the decision making process that was involved when your enterprise decided to enter E-Business?

You can also use an additional sheet of paper and send it back together with the questionnaire.

Please describe the process.

_____
_____
_____
_____
_____

C2-3 Analyse environment

Describe how your enterprise analysed the environment before entering E-Business?

Please describe the analysation.

_____
_____
_____
_____

C2-4 Main reasons E-Business

What were the main reasons for your enterprise to start E-Business?

Please tick all suitable boxes.

☐ advantage in competition
☐ pressure from competition
☐ customer requirements
☐ supplier requirements
☐ employee requirements

APPENDIX I Pilot questionnaire

C2-5 Expected Advantages

What major advantages does your enterprise expect from E-Business

Please tick all suitable boxes
- ☐ increase turnover
- ☐ increase profit
- ☐ increase market share
- ☐ go to new markets
- ☐ improve communication with customers
- ☐ improve communication with suppliers
- ☐ improve communication with employees
- ☐ reduced marketing costs
- ☐ reduced storage costs
- ☐ reduced delivery times

C2-6 Expected Disadvantages

What major disadvantages does your enterprise expect from E-Business

Please tick all suitable boxes
- ☐ high initial costs
- ☐ high running costs
- ☐ security problems
- ☐ employees have insufficient IT skills
- ☐ target group can't use E-Business

C2-7 Amortisation

When did your E-Business activity amortise or when is your enterprise expecting an amortisation of your E-Business activity

Please tick the most suitable box
- ☐ probably never
- ☐ not in the near future
- ☐ within 12 to 24 months after introduction
- ☐ within 6 to 12 months after introduction
- ☐ with 6 months after introduction
- ☐ don't know

21th June 2002

«comp_no»

UNIVERSITY
— OF CENTRAL —
LANCASHIRE

«Company_Name»
«Address_1»
«Address_2»
«Postcode»

BUSINESS LINK

Department of
Business Information Management
University of Central Lancashire
Preston PR1 2HE

Dear Sir / Madam

Tel 01772 894650
Fax 01772 892905

email: memeckel@uclan.ac.uk
www.uclan.ac.uk

Your enterprise is one of 1000 enterprises in Lancashire and Cumbria that have been chosen to participate in a survey conducted by the **University of Central Lancashire** in cooperation with **Business Link North and Western Lancashire.**

The purpose of this survey is to find out more about the use of strategies concerning e-business in small and medium enterprises.

Please take a few minutes to complete the following questions. Since the number of chosen enterprises must not be increased it is very important that as many chosen enterprises as possible answer.

If you are not the right person to complete the questionnaire please forward it to the appropriate person.

Information that you submit will be treated in strict confidence and serial numbers on the questionnaire are solely to identify those to whom reminders are to be sent. Names and addresses will never be passed to third parties

We have tried to keep the questionnaire as short as possible and to ask as few "personal" questions as possible, although some "personal" questions, e.g. about the annual turnover, are necessary to classify your enterprise according to European and British definitions.

If you like to receive a summary of the findings please fill in the sheet "Summary of Findings / Change of Address" and return it together with your questionnaire in the provided prepaid envelope.

Alternatively the questionnaire can be filled in via the Internet at http://www.websurvey.bimserver.com - For further instructions please take a look at detailed instructions in the "Explanations" attachment.

Thank you very much for taking the time to fill in the questionnaire. Your help is really appreciated.

Yours sincerely,

M. Meckel

M. Meckel

englandsnorthwest

INVESTOR IN PEOPLE

12th July 2002

«comp_no»

UNIVERSITY
— OF CENTRAL —
LANCASHIRE

«Company_Name»
«Address_1»
«Address_2»
«Postcode»

Business
Link

Department of
Business Information Management

University of Central Lancashire
Preston PR1 2HE

Tel 01772 894650
Fax 01772 892905

email: memeckel@uclan.ac.uk
www.uclan.ac.uk

Dear «Title» «Firstname» «Surname»

About three weeks ago you received a questionnaire that was sent out to 1000 enterprises in Lancashire and Cumbria because your enterprise was chosen to participate in a survey conducted by the **University of Central Lancashire** in cooperation with **Business Link North and Western Lancashire**.

The purpose of this survey is to find out more about the use of strategies concerning e-business in small and medium enterprises.

Unfortunately we haven't received a response from your enterprise yet. Since the

number of selected enterprises must not be increased it is very important that you reply

to increase the accuracy of the survey results.

We would like to remind you that you can participate online at http://www.websurvey.bimserver.com

Your company number is: «comp_no»
Your password is: «password»

Please take a few minutes to complete the questionnaire online or to fill in the paper-version of the questionnaire that was sent to you.

Information that you submit will be treated in strict confidence and serial numbers on the questionnaire are solely to identify those to whom reminders are to be sent. Names and addresses will never be passed to third parties

If you returned your questionnaire recently we haven't received it before we sent out the reminder. In this case we would like to thank you for participating in this survey.

Yours sincerely,

M. Meckel

M. Meckel

englandsnorthwest

INVESTOR IN PEOPLE

9th August 2002

«comp_no»

«Company_Name»
«Address_1»
«Address_2»
«Postcode»

Business LINK

UNIVERSITY
— OF CENTRAL —
LANCASHIRE

Department of
Business Information Management

University of Central Lancashire
Preston PR1 2HE

Tel 01772 894650
Fax 01772 892905

email: memeckel@uclan.ac.uk
www.uclan.ac.uk

Dear «Title» «Firstname» «Surname»

A few weeks ago you received a questionnaire that was sent out to 1000 enterprises in Lancashire and Cumbria because your enterprise was chosen to participate in a survey conducted by the **University of Central Lancashire** in cooperation with **Business Link North and Western Lancashire.**

The purpose of this survey is to find out more about the use of strategies concerning e-business in small and medium enterprises.

Unfortunately we haven't received a response from your enterprise yet. It is very important that you reply to increase the accuracy of the survey results. Even if you don't use computers or strategies in your enterprise you I would be grateful if you would fill in the questionnaire to prevent a misrepresentation of enterprises that don't use computers or strategies.

We would like to remind you that you can participate online at http://www.websurvey.bimserver.com

Your company number is: «comp_no»
Your password is: «password»

Please take a few minutes to complete the questionnaire online or to fill in the paper-version of the questionnaire.

Information that you submit will be treated in strict confidence and serial numbers on the questionnaire are solely to identify those to whom reminders are to be sent. Names and addresses will never be passed to third parties

If you returned your questionnaire recently we haven't received it before we sent out the reminder. In this case we would like to thank you for participating in this survey.

Yours sincerely,

M. Meckel

M. Meckel

englandsnorthwest

INVESTOR IN PEOPLE

Appendix III Main questionnaire

Section A	General Questions

The answers to the questions in this section will be used to classify your enterprise according to European and British definitions, namely to find out whether your enterprise is an SME, what kind of SME your enterprise is and the kinds of economic activity in which your enterprise is engaged.
Alternatively the questionnaire can be filled in via the Internet at http://www.websurvey.bimserver.com
Your company number is: Your password is:

A1 How many persons are employed in your enterprise?

A2 What is the annual turnover of your enterprise?

	✓
less than £ 0.5 M	✓
between £ 0.5 M and £ 1 M	✓
between £ 1 M and £ 4.5 M	✓
between £ 4.5 M and £ 10 M	✓
between £ 10 M and £ 25 M	✓
More than £ 25 M	✓

A3 What is the legal form of your enterprise?

	✓	
Sole Trader	✓	Go to Question A4
Partnership	✓	Go to Question A4
Private Unlimited	✓	Go to Question A4
Private Ltd Co (LTD)	✓	Go to Question A4
Public Ltd Co (PLC)	✓	Go to Question A4
None of the above	✓	Give Details Below

Please write the legal form of your enterprise down if it is not listed.

A4 How is your enterprise classified according to the UK SIC(92) ? (see Appendix)

A5 How many locations does your enterprise have?

Section B	E-Business

The answers to the questions in this section will be used to find out more about your current or future E-Business activity.

Technical Aspects

1.1 Approximately how many PCs are in your enterprise?

1.2 What other computers and how many of them are used in your enterprise?
(e.g. AS/400, Sun Workstation)

1.3 What percentage of your enterprise's employees are making daily use of PCs at work?

	✓
0%	✓
1%-79%	✓
80%-100%	✓

1.4 Is your enterprise using its own LAN (Local Area Network) or Intranet?

	✓
No	✓
LAN	✓
Intranet	✓

1.5 How does your enterprise access the Internet?

	✓	
No Internet Access	✓	Go to Question B1.8
Manual Dial-up (Modem or ISDN)	✓	Go to Question B1.6
Always connected (Modem or ISDN)	✓	Go to Question B1.6
xDSL, Cable Modem (up to 1 Mbit/s)	✓	Go to Question B1.6
TI, xDSL, Cable Modem, etc. (> 1 Mbit/s)	✓	Go to Question B1.6

1.6 When did your enterprise first connect to the Internet?

	✓
less than 1 year ago	✓
between 1 and 2 years ago	✓
between 3 and 4 years ago	✓
more than 4 years ago	✓

B1.7	Indicate the access rights of the following groups of employees in your enterprise. Please answer by ticking the appropriate boxes using the scale on the right side.	1 every employee
		2 selected employees
		3 office staff
		4 management
			1
			  2
			    3
			      4

	1	2	3	4
access to an own e-mail account at work	✓			
access to the World Wide Web at work	✓			
remote access to your computer system	✓			

B1.8	Does your enterprise have a web presence?			
	No, we haven't thought about this yet.	✓		Go to B1.14
	No, and we don't intend to set one up.	✓		Go to B1.14
	No, but we plan to set up one.	✓		Go to B1.13
	No, but we are currently setting one up.	✓		Go to B1.13
	Yes	✓		Go to B1.9

B1.9	Is your web presence providing dynamic content?		
	No	✓	
	Yes, the dynamic data is for the web presence only	✓	
	Yes, the dynamic data is also used in other areas of the enterprise	✓	
	Only web staff knows technical details	✓	

B1.10	How often is your web presence updated? (modification of dynamic content is not an update)		
	daily	✓	
	weekly	✓	
	monthly	✓	
	less often	✓	
	Only web staff knows techn. details	✓	

B1.11	What do you provide on your web presence?			
	Information about the enterprise itself	✓		
	Information about products and services	✓		
	Means for customers to buy products / services	✓		
	Means for customer support	✓		
	Others	✓		Give Details Below
If you ticked the "Others" box please list what you provide additionally on your web presence				

B1.12	Do you measure the performance of your web presence?		
	No	✓	
	We record the hits, pageviews, sessions, etc.	✓	
	We record and archive the logfiles	✓	
	We analyse the recorded information	✓	

B1.13	Who created / will create your web presence?			
	We don't know yet	✓		
	External company	✓		
	Partnership	✓		
	Dedicated staff from our enterprise.	✓		Give Details Below
	Existing staff, additionally assigned to this task	✓		Give Details Below
	Existing staff from a related department (e.g. PR, advertising)	✓		Give Details Below
Please give additional details about your staff here.	The staff had previous web knowledge	✓		
	The staff were trained to do this job	✓		
	The staff acquired knowledge on their own	✓		

B1.14	How would the enterprise be classified in the e-adoption ladder used by UK online for business?		
	We don't do any form of e-business	✓	
	1. e-mail	✓	
	2. website	✓	
	3. e-commerce	✓	
	4. e-business	✓	
	5. transformed organisation	✓	

| B .15 | Is your enterprise using EDI (Electronic Data Interchange)? | Yes | ✓ | |
| | | No | ✓ | |

usiness Aspects

| 2.1 | Please indicate where the main customers and the main suppliers of your enterprise are. Answer by ticking the appropriate boxes using the scale on the right side. | 1 Main customers | 1 |
| | | 2 Main suppliers | 2 |

		1	2
Local	✓		
Regional	✓		
National	✓		
International	✓		

| 2.2 | Please indicate how your enterprise is taking orders from customers and how your enterprise is ordering from suppliers. Answer by ticking the appropriate boxes using the scale on the right side. | 1 taking orders from customers | 1 |
| | | 2 ordering from suppliers | 2 |

	1	2	
Directly (e.g. Talking directly)	✓		Go to C1.1
Telephone	✓		Go to C1.1
Post	✓		Go to C1.1
Fax	✓		Go to C1.1
E-Mail	✓		Go to C1.1
Internet (except E-Mail)	✓		Go to C1.1
EDI	✓		Go to C1.1
Other Means	✓		Give Details below

Please write your additional means of ordering / taking orders down if they are not listed. Please indicate whether you use them for taking orders, for ordering or for both.

Section C   Strategy

he answers to the questions in this section will be used to gather information about your use of strategy in eneral and about your use of strategy for e-business.

eneral Strategy Aspects

1.1	Does your enterprise have a formal strategy?	No	✓	
		Yes, verbally defined	✓	
		Yes, written down	✓	

1.2	Which strategic models is your enterprise currently using or planning to use in the near future?	None	✓	Go to C2.1
		Five Forces	✓	Go to C2.1
		SWOT	✓	Go to C2.1
		PEST	✓	Go to C2.1
		Value Chain Analysis	✓	Go to C2.1
		Critical Success Factors	✓	Go to C2.1
		Balanced Scorecard	✓	Go to C2.1
		Business Excellence Model / EFQM	✓	Go to C2.1
		Product Portfolio Analysis (e.g. Boston)	✓	Go to C2.1
		Others	✓	Give Details Below
	Please write the strategic models down that your enterprise is using or planning to use and that are not listed.			

2.1	Does your enterprise have a formal E-Business strategy?	No	✓	
		Yes, verbally defined	✓	
		Yes, written down	✓	

| 2.2 | Please describe the decision making process that was involved when your enterprise decided to enter E-Business. There is also an additional piece of paper attached to the questionnaire where you have more space for the description. | |

| 2.3 | Describe how your enterprise analysed the market before entering E-Business. There is also an additional piece of paper attached to the questionnaire where you have more space for the description. | |

2.4	What were the main reasons for your enterprise to start E-Business?	advantage in competition	✓		Go to C2.5
		pressure from competition	✓		Go to C2.5
		customer requirements	✓		Go to C2.5
		supplier requirements	✓		Go to C2.5
		employee requirements	✓		Go to C2.5
		we didn't start E-Business yet	✓		Go to C2.6

2.5	How quickly do you expect your enterprise's investment in E-Business to have paid for itself?	probably never	✓	
		not in the near future	✓	
		within 12 to 24 months after introduction	✓	
		within 6 to 12 months after introduction	✓	
		within 6 months after introduction	✓	
		don't know	✓	

2.6	What major advantages does your enterprise expect from E-Business?	increase turnover	✓	
		Increase profit	✓	
		Increase market share	✓	
		go to new markets	✓	
		improve communication with customers	✓	
		improve communication with suppliers	✓	
		improve communication with employees	✓	
		reduce marketing costs	✓	
		reduce storage costs	✓	
		reduce delivery times	✓	
		no major advantages	✓	

2.7	What major disadvantages or problems does your enterprise expect from E-Business.	high initial costs	✓	
		high running costs	✓	
		security problems	✓	
		employees have insufficient IT skills	✓	
		target group can't use E-Business	✓	
		no major disadvantages	✓	

UNIVERSITY
— OF CENTRAL —
LANCASHIRE

englandsnorthwest

BUSINESS
LINK

Explanations

General:

If you have any questions or problems concerning this survey (e.g. problems logging in) please contact memeckel@uclan.ac.uk or write to

M. Meckel
Business Information Management
Greenbank Building
University of Central Lancashire
PRESTON
PR1 2BR

If you decide to fill in the questionnaire via the Internet then you will be asked to log in with your company number and password.

Your company number is: <company number>

Your password is: <password>

Answering The Questions:

Sometimes you will find additional instruction depending on your answer.

B1.8 Does your enterprise have a web presence?	No, we haven't thought about this yet.	✓	Go to B1.14
	No, and we don't intend to set one up.	✓	Go to B1.14
	No, but we plan to set up one.	✓	Go to B1.13
	No, but we are currently setting one up.	✓	Go to B1.13
	Yes	✓	Go to B1.9

In this example you can go directly to question B1.14 if you tick answer 1 or 2, you can go directly to question B1.13 if you tick answer 3 or 4 and you can go directly to question B1.9 if you tick answer 5.

Question specific:

A1 How many persons are employed in your enterprise?

Explanation:
Write down the number of persons employed in your enterprise

Example:
e.g.   2
e.g.   43
e.g.   200

A2 What is the annual turnover of your enterprise?

Explanation:
Tick the box with the range representing your annual turnover.

A3 What is the legal form of your enterprise?

Explanation:
Tick the box representing the legal form of your enterprise or write the legal form down if not listed

A4 How is your enterprise classified according to the UK SIC(92) ?

Explanation:
UK SIC stands for UK Standard Industrial Classification of Economic Activities. It is sufficient to provide your Section, you are however welcomed to provide Your Subsection, Division, etc. as well.
You can find a summary of the UK SIC(92) sections and subsection in the Appendix on page

Example:
H (Only Section)
CB (Section, Subsection)
17.40/1 (Division, Group, Class, Subclass)

A5 How many locations does your enterprise have?

Explanation:
Write down how many locations your enterprise has. You don't have to write down where the locations are. It is sufficient if you write down how many locations your enterprise has. We expect most smaller enterprises to have only one location.

Example:
An example for two locations: You could have one location in Preston (e.g. for administration and sales) and one in Bolton (e.g. for production).

B1.1 Approximately how many PCs are in your enterprise?

Explanation:
A PC is a Personal Computer. Examples for PCs are IBM compatible PCs with e.g. Windows or Linux as its Operating Systems as well as Computers from Apple with Mac OS as its Operating System. Laptops are also PCs (not "other computers" as in B1.2) You don't have to write down what kind of computers your enterprise has. It is sufficient if you write down how many there are.

B1.2 What other computers and how many of them are used in your enterprise? (e.g. AS/400, Sun Workstation)

Explanation:
Examples of other kinds of computers are e.g. a minicomputer or a mainframe.
Normally minicomputers or mainframes are at least the size of a wardrobe.
If there are no other computers in your enterprise please fill in "n/a"

Example:
1x AS/400

B1.3 What percentage of your enterprise's employees are making daily use of PCs at work?

Please tick the most appropriate box.

Explanation:
Please estimate what percentage of your enterprise's employees are making daily use of PCs at work and tick the appropriate box.

B1.4 Is your enterprise using its own LAN (Local Area Network) or Intranet?

Please tick the most appropriate box. (If you have an Intranet, you don't have to tick LAN additionally)

Explanation:

Short explanation:
If you can save documents from the PCs in your enterprise directly to one PC (e.g. a server) or if you can share printers you have a LAN.
If you can send internal e-mails or access internal web-pages to access information you have an Intranet.

More detailed:
Your enterprise has a LAN if its PCs are connected through a network to share company information or computing resources among employees (e.g. save documents in a central place or share printers)
Your enterprise has an Intranet if web technology is used in conjunction with a LAN to enable staff to communicate with each other, to access information etc. (e.g. internal e-mails, internal web-pages to access information). If you have an Intranet you will automatically have a LAN.

B1.5 How does your enterprise access the Internet?

Please tick as many boxes as you like (or are relevant). (If you have more more than one way to connect to the Internet tick the box for the most advanced one)

Explanation:
Dial-up connection means that the PC or the network gets manually connected to the Internet when needed (e.g. the ISP is dialled when e-mails should be received).
Always connected means that the PC or the network is always connected or gets automatically connected to the Internet when needed, e.g. by using a flatrate connection or by using a router that is automatically connecting the network to the Internet when required.
The most common type of xDSL in the UK is ADSL, offered by many companies, e.g. BT openworld.

B1.6 When did your enterprise first connect to the Internet?

Explanation:
Tick the box representing how long ago you first connected to the Internet

B1.7 Indicate the access rights of the following groups of employees in your enterprise.

Please answer by ticking the appropriate boxes using the scale on the right side.

Explanation:
Tick all appropriate boxes using the scale on the right side.

Example:
In this example office staff has access to an own e-mail account at work and access to the WWW. The management has additionally remote access to your computer system. All other staff have no Internet access.

B1.7 Indicate the access rights of the following groups of Employees in your enterprise. Please answer by ticking the appropriate boxes using the scale on the right side.	1 every employee 2 selected employees 3 office staff 4 management	1 2 3 4

		1	2	3	4
	access to an own e-mail account at work	✓		✓	✓
	access to the World Wide Web at work	✓		✓	✓
	remote access to your computer system	✓			✓

Selected employees can be any employees except office staff and management that have more access rights than normal employees (e.g. employees assigned to a special project). Many enterprises might not have a group of selected employees with special access rights.

B1.8 Does your enterprise have a web presence?

Please tick the most appropriate box.

Explanation:
A web presence is normally a web page with information about the enterprise. The enterprise has no web presence if they have only an e-mail address but no web page. Tick the appropriate box.

B1.9 Is your web presence providing dynamic content?

Please tick the most appropriate box.

Explanation:
Dynamic content can be realised by using a server-side scripting language or similar technologies, e.g. ASP, PHP, JSP, Cold-Fusion, CGI. The content for a webpage will be created on the fly. This could be used to display e.g. the stock of an article on the webpage. The data that is used can be taken from many kind of sources, e.g. a database with the latest prices for your articles.
Please tick "Yes, the dynamic data is for the web presence only" if the data that is used for the web presence is only used for the web presence, e.g. reviews of your articles created by other customers.
Please tick "Yes, the dynamic data is also used in other areas of the enterprise" if the data that is used for your web presence is also used in other areas of your enterprise, e.g. a database with the prices that is used for the web as well as for the a pricelist send to the customers.

B1.10 How often is your web presence updated?

Please tick the most appropriate box.

Explanation:
This question tries to find out how often your web presence is updated, i.e. how often are the files for your web presence updated. Whether the web presence is dynamic or static, please tick the box that represents how often the files are updated (e.g. weekly). If the web presence is dynamic this could be quite rare, because the information is taken from somewhere else, e.g. a database.

B1.11 What do you provide on your web presence?

Please tick as many boxes as you like (or are relevant). If you ticked the "Others" box please list what you provide additionally in the provided space.

Explanation:
Tick all boxes representing information or means you provide on your web presence. You can also list what you provide additionally on your web presence.

B1.12 Do you measure the performance of your web presence?

Please tick as many boxes as you like (or are relevant).

Explanation:
This question tries to find out whether you measure the performance of your web presence. The most basic way to record any information about your webpages is to record the hits, pageviews, sessions, etc. (If your webpage has a counter that counts the visitors you can tick this box).
A more advanced way to record information about your webpages is to record and analyse the logfiles. The logfiles are generated by the webserver. If you HYPERLINK "mailto:don@t"don't have your own webserver you might not be able to access the logfiles. Please tick this box only if you record and archive the logfiles, not if you delete the logfiles without archiving them.
If you analyse the recorded information (hits, pageviews, sessions, etc and/or logfiles), e.g. to find out which section of your web presence is visited most often, you should tick this box.

B1.13 Who created / will create your web presence?

Please tick as many boxes as you like (or are relevant).

Explanation:
Please indicate who created / will create your web presence. If the web presence was created / will be created by staff from your enterprise you should additionally indicate whether the staff had previous web knowledge, whether the staff was trained to do the job or whether the staff acquired the knowledge on their own. If this is different for different members of staff Please tick as many boxes as you like (or are relevant). "Partnership" means that the web presence was created in partnership with somebody else, often with suppliers, e.g. you sell cars produced by x and the web presence is created in partnership with car producer x.

B1.14 How would the enterprise be classified in the e-adoption ladder used by UK online for business?

Please tick the most appropriate box.

Explanation:
UK online for business is using their e-adoption ladder model to classify enterprises according to their adoption of e-business. There are five different classifications in this model.

1. e-mail: your enterprise is using e-mails
2. website: your enterprise has it's own website
3. e-commerce: your enterprise is ordering and / or paying online
4. e-business: your enterprise integrated the supply chain
5 transformed organisation: your enterprise is using open systems information for customers, suppliers and partners

Please tick the box that represents your enterprise best. If this is different for different locations / parts of your enterprise please tick the box representing the most advanced classification available in any location / part of your enterprise.

B1.15 Is your enterprise using EDI (Electronic Data Interchange)?

Please tick the most appropriate box.

Explanation:
We'd like to find out whether your enterprise is using EDI (Electronic Data Interchange). EDI (Electronic Data Interchange) is a standard format for exchanging business data
If you don't know what EDI is then your company is probably not using EDI.

B2.1 Please indicate where the main customers and the main suppliers of your enterprise are.

Explanation:
Tick all appropriate boxes using the scale on the right side.

Example:
In this example the main customers are local and the main suppliers are regional.

B2.1	Please indicate where the main customers and the main suppliers of your enterprise are.	1 Main customers	1	
		2 Main suppliers		2
	Answer by ticking the appropriate boxes using the scale on the right side.		1	2
		Local	✓ ✓	
		Regional	✓	✓
		National	✓	
		International	✓	

B2.2 Please indicate how your enterprise is taking orders from customers and how your enterprise is ordering from suppliers.

Explanation:
Tick all appropriate boxes using the scale on the right side.

Example:
In this example orders from customers are only taken directly (e.g. in your shop) and by telephone and orders for the supplier are only send by post (e.g. a letter) and fax.
You can write down any additional means of ordering / taking orders in the space provided at the bottom of this question box.

B2.2 Please indicate how your enterprise is. taking orders from customers and how your enterprise is ordering from suppliers Answer by ticking the appropriate boxes using the scale on the right side.	1 taking orders from customers 2 ordering from suppliers	1 2			
			1	2	
	Directly (e.g. Talking directly)	✓	✓		Go to
	Telephone	✓	✓		Go to
	Post	✓		✓	Go to
	Fax	✓		✓	Go to
	E-Mail	✓			Go to
	Internet (except E-Mail)	✓			Go to
	EDI	✓			Go to
	Other Means	✓			Give [below
Please write your additional means of ordering / taking orders down if they are not listed. Please indicate whether you use them for taking orders, for ordering or for both.					

C1.1 Does your enterprise have a formal strategy?

Please tick the most appropriate box.

Explanation:
Please indicate whether your enterprise has a formal strategy, and if there is a strategy whether it is verbally defined or additionally written down.
N.B. This question is about your strategy in general, not about your E-Business strategy

C1.2 Which strategic models is your enterprise currently using or planning to use in the near future?

Please tick as many boxes as you like (or are relevant). If you ticked the "Others" box please list what you provide additionally in the provided space

Explanation:
Please tick all boxes representing strategic models that are used in your enterprise. Since it is impossible to list all existing strategic models please list any additional strategic models in the space provided at the bottom of this question box.
If you don't know what a strategic model is you are probably not using one.
N.B. This question is about your strategy in general, not about your E-Business strategy

C2.1 Does your enterprise have a formal E-Business strategy?

Please tick the most appropriate box.

Explanation:
Please indicate whether your enterprise has a formal E-Business strategy, and if there is a strategy whether it is verbally defined or additionally written down.
N.B. This question is about your E-Business strategy, not about your general strategy.

C2.2 Please describe the decision making process that was involved when your enterprise decided to enter E-Business.

Explanation:
Please describe the decision making process that was involved when your enterprise decided to enter E-Business.
There is also an additional piece of paper attached to the questionnaire where you have more space for the description.

C2.3 Describe how your enterprise analysed the market before entering E-Business.

Explanation:
Describe how your enterprise analysed the market before entering E-Business.
There is also an additional piece of paper attached to the questionnaire where you have more space for the description.

C2.4 What were the main reasons for your enterprise to start E-Business?

Please tick as many boxes as you like (or are relevant).

Explanation:
Please tick all boxes that represent the main reasons why your enterprise started / will start E-Business.

C2.5 How quickly do you expect your enterprise's investment in E-Business to have paid for itself?

Please tick the most appropriate box.

Explanation:
Please indicate when you expect your enterprise's investment in E-Business to have paid for itself, i.e. when will you have made enough profit to pay for its own costs.

C2.6 What major advantages does your enterprise expect from E-Business?

Please tick as many boxes as you like (or are relevant).

C2.7 What major disadvantages or problems does your enterprise expect from E-Business.

Please tick as many boxes as you like (or are relevant).
Additional space for your answers (for question C2.2, C2.3, etc.)

APPENDIX IV Material sent with questionnaire

Appendix - Summary of the UK SIC(92) Sections and Subsections

Section	Subsection	Description
A		Agriculture, hunting and forestry
B		Fishing
C		Mining and quarrying
	CA	Mining and quarrying of energy producing materials
	CB	Mining and quarrying except energy producing materials
D		Manufacturing
	DA	Manufacture of food products, beverages and tobacco
	DB	Manufacture of textiles and textile products
	DC	Manufacture of leather and leather products
	DD	Manufacture of wood and wood products
	DE	Manufacture of pulp, paper and paper products; publishing & printing
	DF	Manufacture of coke, refined petroleum products and nuclear fuel
	DG	Manufacture of chemicals, chemical products and man-made fibres
	DH	Manufacture of rubber and plastic products
	DI	Manufacture of other non-metallic mineral products
	DJ	Manufacture of basic metals and fabricated metal products
	DK	Manufacture of machinery and equipment not elsewhere classified
	DL	Manufacture of electrical and optical equipment
	DM	Manufacture of transport equipment
	DN	Manufacturing not elsewhere classified
E		Electricity, gas and water supply
F		Construction
G &		Wholesale & retail trade; repair of motor vehicles, motorcycles personal and household goods
H		Hotels and restaurants
I		Transport, storage and communication
J		Financial intermediation
K		Real estate, renting and business activities
L		Public administration and defence; compulsory social security
M		Education
N		Health and social work
O		Other community, social and personal service activities
P		Private households with employed persons
Q		Extra-territorial organisations and bodies

APPENDIX IV Material sent with questionnaire

Summary of Findings / Change of Address

If you would like to receive a summary of the findings of this survey please fill in this form and return it together with the Questionnaire

Name:

Company Name:

Address:

Company Number:

E-Mail:

Telephone:

Telefax:

APPENDIX V Interview instructions

Interview instructions for interviewer

Company	EMC
Date/ Time	26/11/2003

Company Number	80428

Employees	10
Turnover	less than 0.5 M£
SME Classification	Small

Strategy	Yes, written down
E-Business Strategy	Yes, verbally defined
E-adoption Ladder	e-commerce

Cluster:	e-business strategy leaders

Instructions

O Hand out explanation paper

O Check Employee, Turnover, Strategy, etc (changed Cluster)

Micro (Employees < 9) and (Turnover < 4.5 M £)
Small ((Employees = 10) or (Employees < 49)) and (Turnover < 4.5 M £)
Medium ((Employees = 50) or (Turnover = 4.5 M £)) and ((Employees < 250) and (Turnover < 25 M £))
Not SME

O Do interview

O Check details for summary of the findings

APPENDIX VI Letter for interviewee

Sample letter

Pilot SME

Blackpool

FY1 1JP

UNIVERSITY
— OF CENTRAL —
LANCASHIRE

Dear Mr. Pilot,

Thank you for participating in last summer's survey, and agreeing to participate in the follow up phase.

Department of
Information and Finance
University of Central Lancashire
Preston PR1 2HE
Tel 01772 894671

In the second part – to be conducted this autumn - 30 SMEs will be interviewed about their attitudes towards e-business strategies.

email: memeckel@uclan.ac.uk
www.uclan.ac.uk

You will be asked several questions about your organisation and e-business. The interview will take approximately 30 minutes.

The interviews will be recorded and transcribed but **the identity of your organisation and the actual respondents will be kept confidential.**

Summaries of the findings will be distributed in 2004/2005.

If you have any questions about the interviews you can contact me at the following address:

M. Meckel

Room 44, Greenbank Building

University of Central Lancashire

Preston, PR1 2HE

Tel. 01772 89 4671 e-mail: memeckel@uclan.ac.uk

Yours sincerely,

M. Meckel

M. Meckel

englandsnorthwest

INVESTOR IN PEOPLE

.

Please describe your organisation (what the organisation does, the market and the competitors) and the part you play in its success.

.

Please describe the current e-business situation in your organisation, for example what service you offer on the web, how you use e-mail, where your customers are and so on.

If there is an e-business strategy

Please describe your e-business strategy.

How often did you change your e-business strategy?

If not:

What are the advantages and disadvantages of not using e-business strategies in your organisation?

(Are you thinking about using e-business strategies in the future?)

Please describe the process involved in your organisation's decision to begin your e-business venture.

(How long ago)

Please describe how your organisation analysed the market before entering e-business.

What advantages and disadvantage did your organisation expect before you started e-business and what advantages and disadvantages did your organisation really encounter?

.

APPENDIX VIII Instructions for main interview

Please describe what your company is doing.

Please describe the market and the competitors of your company.

Please describe the part you play in your company's success.

Where are the customers of your company? (Are they regional, national, international)

Please describe the current e-business situation in your organisation.

If not covered: Can you tell me what the major influence was, that made you use the web?

If they don't use the web: Have you thought about using the Internet for e-business and rejected this idea or have you never thought about it.

If they thought about it:

Why did you reject the idea of using the Internet for e-business?

What reasons were there for using the Internet for e-business?

What should have been different so that you would have started using the Internet for e-business?

Please describe your e-business strategy. / the plans you made for e-business / how long in advance do you plan?

How often did you change your e-business strategy?
How often do you revise the IT / these plans?

Please describe the process involved in your organisation's decision to begin your e-business venture.

If not covered: And how long ago did that happen. (write down for last question)

Please describe how your organisation analysed the market before entering e-business.

What advantages and disadvantage did your company expect before you started e-business?

What advantages and disadvantages did your company really encounter?

Can you see any benefits in working out a strategy for the future of
e-business in your organisation?

Can you see any disadvantages in working out a strategy for the future of
e-business in your organisation?

If you are in the same situation as ___ years ago, what would you change?

APPENDIX IX Dendrogram

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                          Rescaled Distance Cluster Combine

        C A S E        0         5        10        15        20        25
      Label      Num   +---------+---------+---------+---------+---------+

      Case 242   221   ─┐
      Case 272   249   ─┤
      Case 27     19   ─┤
      Case 169   155   ─┤
      Case 208   191   ─┤
      Case 138   127   ─┤
      Case 161   148   ─┤
      Case 122   112   ─┤
      Case 136   125   ─┤
      Case 73     63   ─┤
      Case 86     76   ─┤
      Case 61     51   ─┤
      Case 180   166   ─┤
      Case 183   169   ─┤
      Case 67     57   ─┤
      Case 113   103   ─┤
      Case 167   153   ─┤
      Case 106    96   ─┤
      Case 107    97   ─┤
      Case 97     87   ─┤
      Case 102    92   ─┘
      Case 209   192   ─┐
      Case 268   245   ─┤
      Case 1       1   ─┤
      Case 181   167   ─┤
      Case 200   183   ─┤
      Case 152   140   ─┤
      Case 162   149   ─┤
      Case 116   106   ─┤
      Case 149   137   ─┤
      Case 60     50   ─┤
      Case 78     68   ─┤
      Case 16     12   ─┤
      Case 52     42   ─┤
      Case 233   213   ─┤
      Case 269   246   ─┤
      Case 3       2   ─┤
      Case 220   203   ─┤
      Case 230   210   ─┤
      Case 201   184   ─┘
      Case 217   200   ─┘
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Case 175   161
Case 179   165
Case 154   142
Case 172   158
Case 71   61
Case 91   81
Case 43   33
Case 44   34
Case 26   18
Case 28   20
Case 11   8
Case 18   14
Case 186   172
Case 214   197
Case 207   190
Case 243   222
Case 48   38
Case 45   35
Case 160   147
Case 37   27
Case 12   9
Case 40   30
Case 261   239
Case 270   247
Case 29   21
Case 236   216
Case 259   237
Case 178   164
Case 197   181
Case 146   134
Case 159   146
Case 134   123
Case 143   131
Case 75   65
Case 96   86
Case 39   29
Case 57   47
Case 263   241
Case 264   242
Case 10   7
Case 252   231
Case 254   233
Case 238   217
Case 249   228
Case 224   205
Case 231   211
Case 210   193
Case 213   196

```
Case 195    179  ┐
Case 202    185  ┤
Case 135    124  ┤
Case 174    160  ┤
Case 65      55  ┤
Case 121    111  ┤
Case 21      16  ┤
Case 51      41  ┘
Case 266    243  ┐
Case 271    248  ┤
Case 4        3  ┤
Case 258    236  ┤
Case 260    238  ┤
Case 253    232  ┤
Case 255    234  ┤
Case 244    223  ┤
Case 250    229  ┤
Case 222    204  ┤
Case 239    218  ┤
Case 211    194  ┤
Case 212    195  ┤
Case 191    176  ┤
Case 196    180  ┤
Case 187    173  ┤
Case 188    174  ┤
Case 177    163  ┤
Case 184    170  ┤
Case 165    151  ┤
Case 170    156  ┤
Case 153    141  ┤
Case 156    143  ┤
Case 141    130  ┤
Case 150    138  ┤
Case 139    128  ┤
Case 140    129  ┤
Case 130    120  ┤
Case 131    121  ┤
Case 127    117  ┤
Case 129    119  ┤
Case 124    114  ┤
Case 125    115  ┤
Case 120    110  ┤
Case 123    113  ┤
Case 118    108  ┤
Case 119    109  ┤
Case 112    102  ┤
Case 117    107  ┤
Case 109     99  ┘
```

Case 110   100
Case 103   93
Case 104   94
Case 99   89
Case 101   91
Case 95   85
Case 98   88
Case 53   43
Case 64   54
Case 35   25
Case 41   31
Case 9   6
Case 13   10
Case 251   230
Case 262   240
Case 17   13
Case 245   224
Case 246   225
Case 229   209
Case 234   214
Case 206   189
Case 216   199
Case 189   175
Case 193   178
Case 168   154
Case 173   159
Case 151   139
Case 164   150
Case 147   135
Case 148   136
Case 128   118
Case 133   122
Case 111   101
Case 114   104
Case 93   83
Case 100   90
Case 89   79
Case 92   82
Case 85   75
Case 87   77
Case 82   72
Case 84   74
Case 79   69
Case 81   71
Case 70   60
Case 74   64
Case 63   53
Case 69   59

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Case 56      46
Case 62      52
Case 33      24
Case 42      32
Case 20      15
Case 226    206
Case 235    215
Case 5        4
Case 218    201
Case 219    202
Case 205    188
Case 215    198
Case 199    182
Case 204    187
Case 182    168
Case 192    177
Case 166    152
Case 176    162
Case 145    133
Case 157    144
Case 137    126
Case 144    132
Case 108     98
Case 115    105
Case 90      80
Case 94      84
Case 76      66
Case 83      73
Case 66      56
Case 68      58
Case 54      44
Case 59      49
Case 47      37
Case 50      40
Case 30      22
Case 46      36
Case 7        5
Case 25      17
Case 58      48
Case 247    226
Case 105     95
Case 240    219
Case 88      78
Case 171    157
Case 80      70
Case 126    116
Case 267    244
Case 55      45
```

```
Case 72      62    ─┐ │
Case 38      28    ─┤ │
Case 227    207    ─┘ │
Case 248    227    ─┐ │
Case 256    235    ─┤ │
Case 31      23    ─┤
Case 228    208    ─┤
Case 232    212    ─┤
Case 36      26    ─┤
Case 185    171    ─┤
Case 241    220    ─┤
Case 49      39    ─┤
Case 158    145    ─┤
Case 77      67    ─┤
Case 203    186    ─┤
Case 15      11    ─┘
```

APPENDIX X Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	221	249	.000	0	0	28
2	243	248	.000	0	0	6
3	239	247	.000	0	0	10
4	213	246	.000	0	0	35
5	192	245	.000	0	0	55
6	3	243	.000	0	2	13
7	241	242	.000	0	0	8
8	7	241	.000	0	7	18
9	230	240	.000	0	0	19
10	21	239	.000	0	3	32
11	236	238	.000	0	0	13
12	216	237	.000	0	0	32
13	3	236	.000	6	11	17
14	227	235	.000	0	0	22
15	232	234	.000	0	0	17
16	231	233	.000	0	0	18
17	3	232	.000	13	15	26
18	7	231	.000	8	16	31
19	13	230	.000	0	9	25
20	223	229	.000	0	0	26
21	217	228	.000	0	0	31
22	23	227	.000	0	14	40
23	48	226	.000	0	0	233
24	224	225	.000	0	0	25
25	13	224	.000	19	24	39
26	3	223	.000	17	20	43
27	190	222	.000	0	0	57
28	19	221	.000	0	1	91
29	95	219	.000	0	0	229
30	204	218	.000	0	0	43
31	7	217	.000	18	21	42
32	21	216	.000	10	12	82
33	206	215	.000	0	0	41
34	209	214	.000	0	0	39
35	2	213	.000	0	4	44
36	208	212	.000	0	0	40
37	205	211	.000	0	0	42
38	203	210	.000	0	0	44
39	13	209	.000	25	34	58
40	23	208	.000	22	36	209
41	4	206	.000	0	33	46

42	7	205	.000	31	37	54
43	3	204	.000	26	30	53
44	2	203	.000	35	38	63
45	201	202	.000	0	0	46
46	4	201	.000	41	45	59
47	184	200	.000	0	0	63
48	189	199	.000	0	0	58
49	188	198	.000	0	0	59
50	172	197	.000	0	0	231
51	193	196	.000	0	0	54
52	194	195	.000	0	0	53
53	3	194	.000	43	52	71
54	7	193	.000	42	51	68
55	1	192	.000	0	5	79
56	155	191	.000	0	0	91
57	38	190	.000	0	27	231
58	13	189	.000	39	48	72
59	4	188	.000	46	49	65
60	182	187	.000	0	0	65
61	67	186	.000	0	0	176
62	179	185	.000	0	0	68
63	2	184	.000	44	47	85
64	167	183	.000	0	0	79
65	4	182	.000	59	60	78
66	164	181	.000	0	0	82
67	176	180	.000	0	0	71
68	7	179	.000	54	62	122
69	175	178	.000	0	0	72
70	168	177	.000	0	0	78
71	3	176	.000	53	67	74
72	13	175	.000	58	69	92
73	173	174	.000	0	0	74
74	3	173	.000	71	73	83
75	26	171	.000	0	0	209
76	163	170	.000	0	0	83
77	166	169	.000	0	0	80
78	4	168	.000	65	70	94
79	1	167	.000	55	64	106
80	57	166	.000	0	77	142
81	161	165	.000	0	0	85
82	21	164	.000	32	66	112
83	3	163	.000	74	76	95
84	152	162	.000	0	0	94
85	2	161	.000	63	81	104
86	124	160	.000	0	0	122
87	154	159	.000	0	0	92

88	142	158	.000	0	0	104
89	78	157	.000	0	0	166
90	151	156	.000	0	0	95
91	19	155	.000	28	56	119
92	13	154	.000	72	87	107
93	103	153	.000	0	0	142
94	4	152	.000	78	84	113
95	3	151	.000	83	90	105
96	139	150	.000	0	0	107
97	140	149	.000	0	0	106
98	127	148	.000	0	0	119
99	35	147	.000	0	0	203
100	134	146	.000	0	0	112
101	39	145	.000	0	0	230
102	133	144	.000	0	0	113
103	141	143	.000	0	0	105
104	2	142	.000	85	88	182
105	3	141	.000	95	103	116
106	1	140	.000	79	97	139
107	13	139	.000	92	96	111
108	130	138	.000	0	0	116
109	106	137	.000	0	0	139
110	135	136	.000	0	0	111
111	13	135	.000	107	110	128
112	21	134	.000	82	100	123
113	4	133	.000	94	102	120
114	126	132	.000	0	0	120
115	123	131	.000	0	0	123
116	3	130	.000	105	108	118
117	128	129	.000	0	0	118
118	3	128	.000	116	117	126
119	19	127	.000	91	98	133
120	4	126	.000	113	114	147
121	112	125	.000	0	0	133
122	7	124	.000	68	86	187
123	21	123	.000	112	115	178
124	118	122	.000	0	0	128
125	120	121	.000	0	0	126
126	3	120	.000	118	125	129
127	117	119	.000	0	0	129
128	13	118	.000	111	124	144
129	3	117	.000	126	127	131
130	114	115	.000	0	0	131
131	3	114	.000	129	130	135
132	110	113	.000	0	0	135
133	19	112	.000	119	121	180

134	55	111	.000	0	0	187
135	3	110	.000	131	132	137
136	108	109	.000	0	0	137
137	3	108	.000	135	136	143
138	102	107	.000	0	0	143
139	1	106	.000	106	109	192
140	98	105	.000	0	0	147
141	101	104	.000	0	0	144
142	57	103	.000	80	93	149
143	3	102	.000	137	138	146
144	13	101	.000	128	141	161
145	99	100	.000	0	0	146
146	3	99	.000	143	145	151
147	4	98	.000	120	140	164
148	96	97	.000	0	0	149
149	57	96	.000	142	148	157
150	93	94	.000	0	0	151
151	3	93	.000	146	150	155
152	87	92	.000	0	0	157
153	89	91	.000	0	0	155
154	83	90	.000	0	0	161
155	3	89	.000	151	153	159
156	85	88	.000	0	0	159
157	57	87	.000	149	152	236
158	65	86	.000	0	0	178
159	3	85	.000	155	156	197
160	80	84	.000	0	0	164
161	13	83	.000	144	154	165
162	79	82	.000	0	0	165
163	61	81	.000	0	0	182
164	4	80	.000	147	160	177
165	13	79	.000	161	162	169
166	70	78	.000	0	89	229
167	75	77	.000	0	0	169
168	63	76	.000	0	0	180
169	13	75	.000	165	167	172
170	72	74	.000	0	0	172
171	66	73	.000	0	0	177
172	13	72	.000	169	170	174
173	69	71	.000	0	0	174
174	13	69	.000	172	173	183
175	50	68	.000	0	0	192
176	11	67	.000	0	61	230
177	4	66	.000	164	171	186
178	21	65	.000	123	158	208
179	60	64	.000	0	0	183

180	19	63	.000	133	168	191
181	45	62	.000	0	0	226
182	2	61	.000	104	163	205
183	13	60	.000	174	179	189
184	53	59	.000	0	0	189
185	56	58	.000	0	0	186
186	4	56	.000	177	185	196
187	7	55	.000	122	134	216
188	43	54	.000	0	0	197
189	13	53	.000	183	184	195
190	46	52	.000	0	0	195
191	19	51	.000	180	0	236
192	1	50	.000	139	175	219
193	44	49	.000	0	0	196
194	29	47	.000	0	0	208
195	13	46	.000	189	190	211
196	4	44	.000	186	193	201
197	3	43	.000	159	188	210
198	12	42	.000	0	0	219
199	16	41	.000	0	0	216
200	37	40	.000	0	0	201
201	4	37	.000	196	200	212
202	22	36	.000	0	0	212
203	27	35	.000	0	99	232
204	33	34	.000	0	0	205
205	2	33	.000	182	204	214
206	24	32	.000	0	0	211
207	25	31	.000	0	0	210
208	21	29	.000	178	194	240
209	23	26	.000	40	75	227
210	3	25	.000	197	207	222
211	13	24	.000	195	206	217
212	4	22	.000	201	202	223
213	18	20	.000	0	0	214
214	2	18	.000	205	213	221
215	5	17	.000	0	0	223
216	7	16	.000	187	199	240
217	13	15	.000	211	0	242
218	8	14	.000	0	0	221
219	1	12	.000	192	198	238
220	6	10	.000	0	0	222
221	2	8	.000	214	218	238
222	3	6	.000	210	220	245
223	4	5	.000	212	215	242
224	116	244	.505	0	0	234
225	9	30	1.010	0	0	232

APPENDIX X Agglomeration Schedule

226	28	45	1.684	0	181	228
227	23	220	2.568	209	0	235
228	28	207	3.709	226	0	234
229	70	95	4.921	166	29	233
230	11	39	6.134	176	101	235
231	38	172	7.346	57	50	237
232	9	27	9.341	225	203	237
233	48	70	12.169	23	229	244
234	28	116	15.191	228	224	239
235	11	23	19.765	230	227	239
236	19	57	24.960	191	157	241
237	9	38	32.274	232	231	243
238	1	2	40.071	219	221	241
239	11	28	50.491	235	234	244
240	7	21	62.311	216	208	243
241	1	19	80.196	238	236	246
242	4	13	98.462	223	217	245
243	7	9	124.430	240	237	246
244	11	48	157.926	239	233	248
245	3	4	232.251	222	242	247
246	1	7	312.804	241	243	247
247	1	3	489.659	246	245	248
248	1	11	744.000	247	244	0